

NEITHER DECADENT, NOR TRAITOROUS, NOR STUPID:
THE FRENCH AIR FORCE AND AIR DOCTRINE IN THE 1930s

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Anthony Christopher Cain, M.S., M.A.

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Dissertation Committee:

Professor Allan R. Millett, Adviser

Professor John F. Guilmartin, Jr.

Professor John A. M. Rothney

Approved by



Adviser

Department of History Graduate Program

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ABSTRACT

The airmen and politicians who led the *Armée de l'Air* as it served the Third Republic worked diligently to create a military institution that they believed met French defense needs. Their efforts revealed the difficulties that arose when air power theory clashed with established notions of how to employ air forces. Airmen changed their ideas and methods about the proper role for the Air Force to accommodate competing Army and Navy opinions. Reactive doctrine crept into every aspect of the air service because the airmen failed to argue effectively for a distinct vision of warfare predicated on the dominance of the air weapon.

Air force leaders transmitted doctrine and institutional values to operational and tactical commands by several institutional channels. At the lowest levels, airmen learned basic technical skills. Pilot training, aircraft and engine maintenance, radio operator training, and gunnery schools provided specialized training that met the basic job requirements for manning combat units. These schools also gave members their first exposure to air doctrine concealed in the form of technical training. After individuals completed basic technical training and reported to their assigned tactical units, exercises, and maneuvers became the primary means of transmitting and refining air doctrine. Performance and behavior in day-to-day training, and, more importantly, in annual exercises indicated the degree that air force members accepted or rejected official

doctrine. The degree and frequency of change in the structures and methods of the French training and education system also provided insight into institutional values and tactical effectiveness.

The defeat of 1940 rocked the nation's military institutions. The Air Force, in particular, shouldered a large portion of the blame for the military's poor performance. The leaders of the institution sought to derive lessons from the battles of the war so that the disaster of 1940 would not reoccur. Air Force leaders launched an investigation into the conduct of the air war. Officers from combat and combat support specialties responded to requests for reports on their wartime experiences. In the harsh, painful process of self-examination and critique, Air Force personnel identified important areas for doctrinal and institutional change.

Dedicated to my wife, Mechieal Cain

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A writing project such as this may seem to some to be the product of a single mind. Yet, no one who attempts such a task emerges with this impression intact. The list of those to whom I owe emotional and intellectual debts is long. At the Air Command and Staff College, Colonel (ret.) John Warden and Lieutenant Colonel (ret.) Larry Weaver, established an atmosphere that encouraged and rewarded intellectual development. Colonel Weaver's tireless efforts to set up the advanced degree program allowed me to begin this project; his timely and insightful feedback on each chapter helped me to complete it. Lieutenant Colonel Jim Forsyth and Dr. Rich Muller allowed me to focus on completing the manuscript. Colonel (retired) Tommy Dickson encouraged my research efforts and provided essential technical resources that made my time in Paris more productive. Dr. Bill Dean and Major Vicki Rast (Ph. D.) provided intellectual and emotional support well beyond the call of duty.

A grant from the Institute of National Security Studies made my trip to the *Service Historique de l'Armée de l'Air* at the Château de Vincennes just outside of Paris possible. Général (C. R) Hugues Silvestre de Sacy offered his kind assistance and that of his staff while I gathered the primary material that formed the core of this study. His permission to scan thousands of documents made my research efforts much more practical. Patrick Facon, François Pernot, and Marie Catherine Villatoux listened

patiently to my ideas and did not condemn me for butchering their native tongue.

Professor Facon graciously commented on organization and provided critical advice on sources. Laurent Henninger of the *Centre d'Études d'Histoire de la Défense* also offered encouragement. Without the expert help of these professional historians, my dissertation would remain ill formed.

At The Ohio State University, Professors John Guilmartin, Mark Grimsley, John Rothney, John Burnham, and Geoffrey Parker served as excellent professional role models. My primary dissertation adviser, Allan Millett, struck the ideal balance between enthusiasm for the project and direction. With so many top-notch scholars guiding my efforts, one might anticipate a flawless product, however, I cannot lay any blame for the shortcomings of this work at their feet. They offered their best advice; any flaws resulting from my failure to capitalize on that advice are mine.

As much as the aforementioned individuals contributed to the completion of this dissertation, my family suffered its birth pangs. My children, Jessica, Micah, and Ryan, have, more often than not, seen their father with his nose in a book or glued to a computer screen. Yet, like most children, when I remembered that they were infinitely more important than any piece of historical literature, they welcomed me with unconditional love and affection. My wife Mechieal remains the rock upon which our family depends. She shouldered the responsibilities of both mother and father while I traveled to Paris, she listened patiently to my endless musings about the writing process, and she reminded me that there is life after graduate school. Mechieal has honored me with her love and companionship for nineteen years; any success I attain stems from her unfailing loyalty and support—it is to her that I gratefully and lovingly dedicate this effort.

VITA

August 16, 1958.....Born—Marietta, South Carolina

1988..... M. S., Embry-Riddle Aeronautical University

1996..... Course Director, Theater Air Campaign
Studies Course, USAF Air Command and
Staff College, Maxwell Air Force Base,
Alabama

1998..... M.A., History, The Ohio State University

1999..... Academic Instructor and Advisor, Department
of International Security and Military Studies,
USAF Air Command and Staff College,
Maxwell Air Force Base, Alabama

Present.....Course Director, Air Power Studies Course,
USAF Air Command and Staff College,
Maxwell Air Force Base, Alabama

PUBLICATIONS

1. "The Military-Technical Revolution in the Interwar Years: Strategic Bombardment," War Theory Curriculum Coursebook, USAF Air Command and Staff College, Maxwell Air Force Base, Alabama (1995).
2. "The Mechanics of War Termination: Planning for Engagement and Enlargement," War Termination Curriculum Coursebook, USAF Air Command and Staff College, Maxwell Air Force Base, Alabama (1995).

FIELDS OF STUDY

Major Field: History

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CHAPTER 1

INTRODUCTION

No military action may occur, on the land or on the sea, without aerial participation, freedom of action is assured only when one possesses mastery of the air.¹

During the interwar period, and especially after 1933, the leaders of the French air arm pursued doctrines and developed institutional structures that led to a unique expression of air power. The French case was singular because, unlike American, British, and German airmen, the leaders of the *Armée de l'Air* tried to create a force capable of applying air power to nearly every security challenge that emerged in the years following the Great War. Since the early days of military aviation air power theorists proposed that the key to understanding and capitalizing on the revolutionary nature of the air weapon lay in acknowledging the offensive nature of aerial combat. The French, however, developed a doctrine and accompanying force structure designed to provide *reactive air power*.

¹ Service Historique de l'Armée de l'Air (hereafter S.H.A.A.), Série 3D, Carton 477, Secrétariat d'Etat à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Première Partie," March 1942: 10. Unless otherwise indicated, all translations are my own.

The term *reactive air power*, as it applied to the French case, describes a complex conception of aerial warfare. French airmen did not use the term reactive air power to express their ideas about aerial warfare. The leaders of the *Armée de l'Air* would have felt very comfortable, however, with the term and its implications. To French airmen, the ability to react meant more than simply battling with an aggressive enemy for initiative and aerial advantage. The strategic challenges of the 1930s forced French aviators to develop doctrine and forces applicable to a broad range of strategic, operational, and tactical tasks. Consequently, France came to possess an air arm that stressed offense, defense, reconnaissance, air interdiction, strategic bombing, close air support, airborne assault, and colonial operations. Nations that specialized in one or two of these missions developed doctrine, training methods, aircraft, and support structures that yielded a more efficient and effective military force when war erupted in 1939-1940. The French, who opted for an aviation component capable of reacting to every strategic, operational and tactical task, were rarely efficient. What is surprising about the French approach is that the air arm proved remarkably effective as an instrument of strategic deterrence for most of the 1930s. In 1940, however, the effects of attempting too many roles and missions caught up with the French air force; as the Blitzkrieg crashed down on France the air force could not effectively help to counter the onslaught owing, in part, to the many things required of it.

What made the French approach to the aviation revolution of the interwar years unique was the attention dedicated to virtually every conceivable approach to air warfare. American and British airmen concentrated on theories of strategic bombardment as the institutional model for doctrine, force structure, and organization. German air leaders

toyed with strategic bombing until 1938 or so, but politico-strategic requirements and industrial capabilities forced a turn to air superiority, interdiction, and close air support as the primary doctrinal missions. The Red Air Force nearly disappeared as an organization that generated doctrine after the purges in 1937-1938. The loss of Marshal Tukhachevsky and other innovators limited thinking in the Soviet air arm to air superiority and close air support doctrines.² As for Japan, the vast distances of the Pacific and Asian theaters combined with interservice rivalry to relegate aviation to integrated yet supporting roles for the Imperial fleet and the Army.³

The fundamental aim of this study is to assess the operational effectiveness of the French Air Force as it prepared for war against Nazi Germany.⁴ To obtain an objective appraisal of a particular institution's effectiveness one must assess political, strategic, operational, and tactical characteristics in order to develop a true composite of how military institutions carry out their assigned tasks. Studies of how French aviation performed in May and June 1940 focus largely on strategic designs or tactical performance. Such efforts yield insight, in the case of strategic studies, into how French

² For a survey of European approaches to air power doctrine see James S. Corum, "Airpower Thought in Continental Europe between the Wars," in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, AL: Air University Press, 1997): 151-181.

³ Geoffrey Till discusses the role of air power in the Imperial Japanese Fleet; see Geoffrey Till, "Adopting the aircraft carrier: The British, American, and Japanese case studies," in Williamson Murray and Allan R. Millett, eds., *Military Innovation in the Interwar Period* (Cambridge: Cambridge University Press, 1996): 191-226.

⁴ Richard J. Overy suggests that operational effectiveness results from performance in five areas: strategic conception, economic capability, scientific and technical mobilization, political and social reception, and combat effectiveness. See Richard J. Overy, "Air Power in the Second World War: Historical Themes and Theories," in Horst Boog, ed., *The Conduct of the Air War in the Second World War: An International Comparison* (New York: St. Martin's Press, 1992): 7-28.

politicians and diplomats thought about air power in the context of European politics. As for analyses of tactical performance, one may gain an appreciation for how combat experiences shaped individual lives, but such knowledge often fails to communicate the underlying operational and institutional causes for combat outcomes. The common result of tactical narratives is the propagation of the patriotic "Knights of the Air" school of French air power historiography. Personalities and events loom so large in this tradition that one rarely discerns the underlying structural developments that shaped the institutional character. In any event, few studies shed light on how the French air establishment prepared intellectually and organizationally for operational warfare.

Those who try to explain how the French military attempted to solve the strategic problems of the interwar period enter an emotionally charged arena. Many assign blame for the defeat or condemn the members of the military for failing to adopt more effective, "modern" methods of warfare in time to defeat the Germans. Robert J. Young writes that historians and pundits alike attribute the defeat in 1940 to conspiracy, treason, incompetence, stupidity, paralysis, and degeneration.⁵ Rather than tilting at these explanatory windmills, this study follows Professor Young's example as well as that of Robert A. Doughty and Eugenia C. Kiesling who ask questions of the French military from the perspective of the 1930s rather than from a position of perfect knowledge of the outcomes of the 1940s.⁶

⁵ Robert J. Young, *France and the Origins of the Second World War* (New York: St. Martin's Press, 1996): 49.

⁶ See Robert A. Doughty, *The Seeds of Disaster: The Development of French Army Doctrine, 1919-1939* (Hamden, CT: Archon Books, 1985). Robert A. Doughty, *The Breaking Point: Sedan and the Fall of France, 1940* (Hamden, CT: Archon Books,

In the 1930s, French leaders recognized that using air power to deter Germany and to bolster the network of alliances with the smaller East European countries meshed well with the inherently offensive nature of the air arm while offering attractive economy of force options.⁷ Moreover, plans to support allies with air power in the event Germany launched a war in the East allowed politicians to claim purely defensive intentions in Western Europe, thereby preserving the moral high ground in diplomatic negotiations with the Germans. Relying on air power in the East also permitted the Army to remain faithful to its doctrine of firepower and fixed defenses. French leaders at the time understood that the Army's choice of a defensive doctrine made sense; it was a rational choice based upon calculations of historical experience, existing force structure, national demographics, and political will. Finally, strategic predictions in the early 1930s caused French Air Force leaders to expect a war in 1936 or at the latest in 1938.⁸ These expectations shaped decisions to modernize the air force with the best aviation technology available at the time—technology that proved to be a generation too old in 1939-1940.

A reasonable perspective assumes that the men who answered the call to lead France and her air force in the 1930s were neither decadent, nor stupid, nor traitorous.

1990). Eugenia C. Kiesling, *Arming Against Hitler: France and the Limits of Military Planning* (Lawrence, KS: University of Kansas Press, 1996).

⁷ See Thierry Vivier, "La coopération aéronautique franco-tchécoslovaque (janvier 1933-septembre 1938)" *Revue historique des armées* (March 1993): 70-79. Thierry Vivier, "L'aviation française en Pologne (janvier 1936-septembre 1939)" *Revue Historique des armées* (Dec 1993): 60-70.

⁸ Thierry Vivier studied the *Armée de l'Air's* assessment of German intentions and the effects of that assessment on procurement decisions in the mid-1930s. See Thierry Vivier, *La Politique Aéronautique Militaire de la France, Janvier 1933-Septembre 1939* (Paris: Éditions l'Harmattan, 1996): 183-238.

Most of France's political and military leaders during the interwar period survived the trial by fire in the First World War. These men were intensely patriotic, highly intelligent, and intimately familiar with the sacrifices that war demanded. Knowing the horrible price that was possible, they tried their best to prepare the nation for war using the information and resources at hand. To be sure, they made some bad decisions. But their bad decisions did always stem from impure motives, nor do good decisions always guarantee victory in battle.

Since the end of the Riom trial in 1942, air force historiography followed three schools of thought: the first assigned blame for the defeat of 1940, the second focused on political-military relations of the Third Republic, and the third revised earlier perspectives in the search for lasting conclusions about air power and military institutions. Early assessments of how the *Armée de l'Air* performed followed the judgments established at the Vichy-ordered trial. Marshal Philippe Pétain directed the High Court of Justice to single out political leaders like Léon Blum, Pierre Cot, and Guy La Chambre for failing to prepare the nation for war. On the military side, the air force bore the brunt of the blame for the military defeat. According to this approach, the judgement of the High Court of Justice was essentially correct. Third Republic politicians, especially those of the Popular Front, had squandered time and money in futile attempts to appease Germany while fatally weakening the nation's military and social institutions. The air force, which had become an instrument of the Left under Pierre Cot's tutelage, added insult to injury by refusing to fight in the critical battles of May and June. Following this tradition to its conclusion, one finds that the army was not

responsible for the defeat of 1940 because French land forces could not compete on par with German air-land superiority.

A special issue of the *Revue Historique de l'Armée*, published in 1969, illustrated the persistence of the combined effects of shame and myth on the historiography of the air force throughout the 1950s and 1960s. The editors devoted the 167-page issue to the history of French military aviation. Fifteen authors, including serving airmen and staff members at the Musée de l'Air, contributed articles that traced efforts to build the air service. The disdain shown by the authors for the interwar period—the period when the air force gained independence from the Army and Navy—was interesting. Seven articles focused on early efforts to conquer the skies. The creativity, heroism, and valor of France's early aviation community comprised the main themes that emerged from this sampling of articles. National honor peaked during World War I according to the authors of this interpretation of French air power history. The balance of the issue contained studies of post-World War II aviation developments and how those developments reflected the legacy of the early years. There was no attempt to describe how interwar air leaders organized the service for peace and war, how air doctrine evolved, how the air force contributed to the strategy-making process of the 1930s or to the battles of 1940.

The second school of air force historiography focused on political-military relations. Robert W. Krauskopf's dissertation, written in 1965, remains one of the best studies in this tradition.⁹ Krauskopf acknowledged how the Riom proceedings had influenced the tone of scholarly attention directed toward the air service. He looked

⁹ Robert W. Krauskopf, "French Air Power Policy, 1919-1939" (Ph. D. diss., Georgetown University, 1965).

beyond the effects of the trial, however, to explain how France's military aviation had deteriorated during the 1930s while that of Germany, her principal rival, had grown. But those who follow this approach focus primarily upon the interaction between ministers and generals, thereby giving short shrift to the equally important operational and tactical mechanisms with which the airmen expected to fight the next war.¹⁰

Since the mid-1970s, historians revised earlier assessments of the interwar French air force. The revisionists preserved elements of the heroic traditions of the First World War and the early 1920s, but began to explore the processes that led to the development of the independent air force. Authors like Patrick Facon, Patrice Buffotot, François Pernot, Pascal Vennesson, and Claude d'Abzac-Epezy mined the sources in the archives at the *Service Historique de l'Armée de l'Air* at Vincennes to create a more complete narrative of the interwar French air force. The revisionists often acknowledge some air force culpability for the defeat of 1940, but reject the extremes of the earlier Riom-dominated tradition. Theirs is a richer version of air force history that looks for causation in institutional structures, social composition, and operational factors while building upon the conclusions of the political-military explanations of the 1960s. Moreover, the revisionist historians find links between the air force of the interwar years and the air force that survived the German occupation to play a role in the resistance and subsequent liberation.

The *Armée de l'Air* obviously failed to perform its assigned operational missions in 1940. But military organizations, as a rule, do not willingly plan to be defeated; the

¹⁰ For the most recent example of this genre see Vivier, *La Politique Aéronautique Militaire de la France*.

French air service was no exception.¹¹ The magnitude and the rapidity of the defeat in 1940 concealed French airmen's efforts to prepare for war in the 1930s. As Eugenia Kiesling correctly points out, neither the American disaster at Pearl Harbor nor Russia's near collapse at the hands of Germany in 1941 evokes the derision that the French experience does.¹² The way that the Battle of France ended and the subsequent consequences for the nation set the defeat of 1940 apart from other catastrophes of the Second World War. The nation surrendered the field with operational and tactical options still unexplored. Compounding the shame and humiliation of the defeat was the deceptive material strength that the Air Force possessed when the government ordered its forces to cease resistance in June.

Archival sources show that French aviators articulated a robust concept of how aviation could contribute to a war against Germany. Between 1933 and 1940, service leaders laid the philosophical and material foundations for combat performance in 1940. The processes by which airmen developed air doctrine, trained and equipped aviation units, and executed their war plans provide the framework for this study.

The first clues to understanding how the leaders of the *Armée de l'Air* reacted to the challenges of the 1930s reside in the various aviation doctrines published between 1933 and 1940, and in the processes by which the airmen developed and refined that

¹¹ "The code of responsibility is drummed into officers from their first days as subalterns. Their right to command rests, ultimately, not only on their acceptance of greater risk and hardship than those under their command but on their willingness to accept responsibility. To say that a spectacular failure is either nobody's fault, or everybody's, or indeed the consequence of a complicated chain of events and decisions, is to undermine the moral order an army requires in order to be able to fight." Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: Vintage Books, 1991): 33.

doctrine. Members of France's military aviation community remained acutely aware of their nation's expectations as well as the air arm's strengths and weaknesses throughout the troubled 1930s. But military solutions to the problems presented by German political and military aggression were not always obvious, nor were they always palatable to the French public. One must attempt to understand how strategic and political pressures affected the attitudes, options, and actions of the *Armée de l'Air*.

Histories of interwar air power doctrine often focus on how strategic bombing concepts evolved to produce the campaigns that devastated Germany and Japan. The results of the bombing campaigns against the Axis powers in the Second World War appeared to vindicate arguments of early air power theorists by showing how aviation could decisively alter the nature of warfare. The limited evidence that those in the 1930s confronted, however, offered only uncertain answers to questions about how best to employ air power in modern war. The promise of air power, in other words, was often greater than the combination of political will and aviation technology could deliver. This was especially true in interwar France. What is significant about the historiography of aeronautical doctrine is the scant attention given to how French ideas about the use of air power evolved.¹³

The strategic air power theories of Giulio Douhet influenced French airmen in the 1920s and 1930s as they struggled to resolve the challenges presented by rapidly changing aeronautical technologies and a shifting strategic environment. The aviators of

¹² Kiesling, *Arming Against Hitler*, xii.

¹³ Thierry Viver comments, "...the history of French military aviation has remained a minor genre, far at the margins of the French Academy." Vivier, *La Politique Aéronautique Militaire de la France*, 15.

the *Armée de l'Air* were not dogmatic, however, in their acceptance or rejection of Douhet's ideas. Like the British, Americans, and Germans, French aviators selected only those concepts from Douhet's writings that applied to their political, social, and military situation. As innovative as some of Douhet's ideas were, the French recognized the Italian's theories for what they were: a departure point. Each nation, each air force, had to tailor basic air power theory, from multiple sources, to form a useable doctrine.

The Gordian Knot that French aviators puzzled over was how to satisfy the diplomat's demands for a strategic force capable of projecting power toward Central and Eastern Europe and the Army's demands for aerial intelligence and air superiority on the battlefield.¹⁴ The result of their efforts to juggle these often competing and contradictory demands for scarce aerial resources was a reactive air power doctrine, backed by institutional structures and operational plans, that represented the consensus among air service members on how best to employ air forces for national defense. That their efforts met with so little success in the Battle of France masked the energy and creativity the airmen expended to create an institution that they believed met their nation's defense needs.

Doctrine serves no purpose without training institutions and facilities to insure that it filters down to combat units. One key to arriving at an assessment of operational effectiveness is to evaluate the ability of an organization to convince its members that the institution is on the right ideological and doctrinal path. Air force leaders transmitted these themes to operational and tactical commands by several institutional channels. At

¹⁴ See J. Néré, *The Foreign Policy of France from 1914 to 1945* trans Translance (London: Routledge and Keegan Paul, 1975).

the lowest levels, airmen learned basic technical skills. Pilot training, aircraft and engine maintenance, radio operator training, and gunnery schools provided specialized training that met the basic job requirements for manning combat units. These schools also gave members their first exposure to air doctrine concealed in the form of technical training.

After individuals completed basic technical training and reported to their assigned tactical units, maneuvers, exercises, and wargames became the primary means of transmitting and refining air doctrine. Performance and behavior in day-to-day training, and, more importantly, in exercises and wargames indicated the degree that air force members accepted or rejected official doctrine. The degree and frequency of change in the structures and methods of the French training and education system represents one indicator of member satisfaction with institutional values and provides insight into operational and tactical effectiveness.

The final phase of doctrinal development occurs when military institutions make adjustments during and after combat. In the French case, the defeat of 1940 rocked the nation's military institutions. The Air Force, in particular, shouldered a large portion of the blame for the military's poor performance. Yet in defeat, the leaders of the institution sought to derive lessons from the battles of the war so that the disaster of 1940 would never reoccur. After the defeat, air force leaders, under the rubric "Commission G," launched an investigation into the conduct of the air war. Officers from combat and combat support specialties responded to requests for reports on their wartime experiences. In the harsh, painful process of self-examination and critique, Air Force

personnel identified important areas for doctrinal and institutional change. The history of this process remains largely absent from French air power studies.¹⁵

The overriding conclusion that emerges from this study is that military institutions are incredibly resilient. The French air force shared the burden of national defense with their countrymen in a time of strategic uncertainty and unprecedented technological change. Airmen often found their actions constrained by economic and political bonds that forced them to act in ways that at times contradicted sound military judgment and doctrinal precepts. Yet, aviators rose to defend their nation, suffered the humiliation of defeat, and endured the chaos of enemy occupation to emerge with the basic structures of their institution intact. Far from being a story of decadence, stupidity, or treason, such a tale fits surprisingly well within the *chevaliers de l'air* traditions of the early days of French military aviation.

¹⁵ Two notable exceptions are Thierry Vivier, "La Commission G: Entre la défaite et l'Armée de l'Air future (1941-1942)", *Revue Historique des Armées* 3 (1989): 113-121; and Claude d'Abzac-Epezy, *L'Armée de l'Air de Vichy* (Vincennes: Service Historique de l'Armée de l'Air, 1997), 363-372.

CHAPTER 2

SOURCES OF REACTIVE AIR DOCTRINE

The progress of aviation, marked by a considerable increase in the power, the speed, and the radius of action of its machines offers enhanced possibilities for cooperation with the Army.¹

Doctrine and organizational change often stem from recent combat experience.

Two primary events offered the fledgling French air arm opportunities to learn lessons from the combat application of air power. The first was the Great War. No influence was more pervasive on how French air doctrine developed than the historical legacy of the First World War. Between 1914 and 1918, Allied and German aviators pushed the limits of aviation technology in efforts to help restore mobility to the deadlocked struggle on the Western Front. In the process, all of the major missions of air power, with the possible exception of airborne assault, emerged in nascent form.² By 1918, French

¹ S.H.A.A., Série 2B, Carton 109, Ministère de la Guerre, "Instruction sur l'Emploi Tactique des Grandes Unités," (Paris: Imprimerie Nationale, 1936): 17.

² Although there were no airborne operations during the war, the American air power pioneer William "Billy" Mitchell proposed a division-level parachute assault behind German lines in 1918. See Mark A. Clodfelter, Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thought," in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell Air Force Base, AL: Air University Press, 1997): 79-114.

military specialists concluded that air power contributed to the commander's ability to "see the enemy...to assist artillery and to control its fires—to fight in close liaison with the infantry; to protect the soldiers from detection and raids by the enemy...and to throw his bombardment squadrons directly into the battle as a new arm of intervention."³ The second combat experience that contributed to French air power occurred in colonial operations, especially in the 1925 Moroccan Rif War. Taken together, the two wars offered French airmen a snapshot of aviation's potential across the spectrum of conflict.

FRENCH AIR POWER AND THE LEGACY OF WORLD WAR I

France emerged from World War I as the world leader in military aviation.⁴ Her factories equipped her own air force as well as those of her allies. Her training facilities kept a steady stream of pilots, gunners, observers, and mechanics flowing toward the fighting fronts. Her position as the world's aviation leader seemed secure, at least within the European aviation community, at the end of the war, especially when screened by the terms of the Versailles treaty that prevented Germany from developing and maintaining a military aviation capability.⁵ Even the dramatic demobilization that came with the peace

³ "Avant Propos," *Revue de l'Aéronautique Militaire*, 1 (Jan-Feb, 1921): 2.

⁴ See Robin Higham, "Air Power in World War I, 1914-1918" in Alan Stephens, ed., *The War in the Air, 1914-1999: Proceedings of a Conference Held by the Royal Australian Air Force in Canberra* (Fairbairn ACT: Air Power Studies Centre, 1994): 23-45.

⁵ The authors of the Treaty of Versailles attempted to guarantee Allied sovereignty in aviation matters. Part V, Article 198 stipulated "the armed forces of Germany must not include any military or naval air forces." But Article 201 promised to be more important than the demobilization of the air forces. This article stated "During the six months following the coming into force of the present Treaty, the manufacture and importation of aircraft, parts of aircraft, engines of aircraft, and parts of engines for aircraft, shall be

that followed Versailles failed to shake the nation's confidence in the air service.

Although the French government recognized the need to preserve a degree of institutional identity for the air arm after the war, it did so within the confines of the land army. The *Aéronautique Militaire* was the army's aviation branch for most of the 1920s. Because aviation remained a combat arm of the land service, the first published aviation doctrine derived from that institutional identity. The *Instruction sur l'Emploi Tactique des Grandes Unités*, the army's basic doctrine manual, remained virtually unchanged between 1921 and 1936 regarding the army view of air power employment. "The progress of air power," remarked the authors of the 1936 manual, "offers to the army increased possibilities for cooperation." Although such progress may have spawned optimism among airmen and air theorists, the same technical advances were available to enemy powers. Consequently, French army commanders expected aviation to provide "an organization and reinforcements corresponding to the various elements of aerial defense...in order to allow the land forces to shield themselves from enemy air power and to repulse its attacks."⁶ This perspective reflected little change in the attitude of army leaders from the days of World War I when the primary mission for aviation was to observe the enemy lines and to warn of possible attacks.

The cornerstone of reactive air doctrine was the requirement, born in the World War experience and imposed by the Army during the 1920s, for the air force to devote

forbidden in all German territory." See *The Avalon Project at the Yale Law School: The Versailles Treaty June 28, 1919—Part V*, <http://www.yale.edu/lawweb/avalon/imt/partv.htm>.

⁶ S.H.A.A., Série 2B, Carton 109, Ministère de la Guerre, *Instruction sur l'Emploi Tactique des Grandes Unités*, (Paris: Imprimerie Nationale, 1936): 17.

significant energy and resources to supporting land warfare objectives. As national strategy and Army doctrine settled around an emphasis on the fixed front and defense in depth, air power leaders had to devote significant resources to defending the airspace along the front lines. Thus, the precedent for reactive air doctrine stemmed from the tension between army requirements for air power to provide security for the corps battle areas and from airmen's visions of aviation's offensive striking power.

In the early interwar years, theories of strategic bombardment had not replaced the World War I paradigms that defined the roles and missions of the air service in terms relating to the outcome of land combat. Aviation units were subordinate to ground units, even to the extent of assigning responsibility for selecting airfield locations to ground commanders.⁷ By the end of the war, the French military establishment identified five missions for the air service. These missions were: Observation, Pursuit, Bombardment, Aerostation (captive balloons), and Anti-aircraft Defense.

In the positional warfare of the Western Front observation aviation contributed to the objectives of the ground commander more significantly than any other form of air power. One contemporary text noted the importance of maintaining "perfect liaison with the [ground] commander...in order to know what to look for...failing this, the hours of observation will be perfectly useless."⁸ This report devoted fifty-three pages of

⁷ One source left no room for doubt about this responsibility: "it is the duty of the commander of the ground forces to prescribe the location of new landing fields." The source concludes, "this problem of landing field should be placed in the front rank among the thoughts of the commander relative to his air service, *even ahead of the missions given to it.*" [emphasis added]. Albert F. Simpson USAF Historical Research Agency (hereafter HRA), File 248-262-13, "Selection of landing fields:" 3.

⁸ HRA, File 248.262-13, "Employment of Air Observation,": 1. This is a military attaché report that included translations of letters and instruction manuals from the *École*

instruction to air observation and only eight to pursuit, five to bombardment, nine to aerostation, and eight to anti-aircraft defense. In the 1930s, as French ideas about land warfare solidified around the continuous front and the methodical battle, army leaders came to rely even more heavily on having abundant observation aviation resources. This demand for aerial observation support became an important source of reactive air doctrine in the years leading up to World War II.⁹

While observation supported the ground commander's ability to control the pace and scope of the battle, pursuit aviation evolved early in the war to secure air superiority. Ground commanders assigned pursuit missions primarily to secure freedom of action for friendly observation aircraft. French thinkers gradually applied this air power role within a defensive context because of the operational constraints of positional warfare and the limited range and striking power of World War I-era airplanes. As one text described the role of pursuit aviation, "the essential missions of pursuit consist in: a) protection of friendly aviation; and b) attack of enemy aviation."¹⁰ If battlefield conditions required pursuit units to perform outside these essentially defensive constraints, commanders assigned pilots to accomplish reconnaissance missions or to attack enemy troop

Militaire et d'Application du Génie. Most of the documents in this file date from the mid-1920s, but reflect the Army's institutional opinion about how to use aviation in the later years of the World War. It is not clear whether the military attaché or the officers of the Air Corps Tactical School translated the report.

⁹ For a brief discussion of the doctrine of the continuous front see Capitaine J. -M. Marill, "La Doctrine Militaire Française Entre les Deux Guerres," *Revue Historique des Armées* 3 (1991): 24-34. Robert A. Doughty describes the command philosophy of the methodical battle as an intensification of the methods of the First World War in *The Breaking Point: Sedan and the Fall of France, 1940* (Hamden, CT: Archon Books, 1990): 7-32.

¹⁰ HRA, File 248.262-13, "Missions of Pursuit Aviation," 23.

formations.

Bombardment operations represented the only doctrinal use of aviation for offensive purposes during the war. The limited range and payload of early bombardment-type planes did not prevent French planners from recognizing the potential in reaching toward the sources of enemy combat power. The instructors at the *École Militaire et d'Application du Génie* distilled the aviation lessons from the World War into an Air Service course. The result of their efforts was a doctrinal statement that concluded that the most efficient method of employing bombardment aviation was in “prolonging the action of artillery and supplementing its action whenever artillery is powerless either due to the great distance from, or the fugitive nature of the target.”¹¹ Despite air power’s potential to affect lucrative targets behind the front, the army maintained that the advantages of bombardment in direct combat were best realized when “the special means and efficacy of the Air Service are placed at the service of the ground troops.”¹² In other words, the World War I experience led French land warfare oriented military strategists to establish a paradigm that limited bombardment aviation to a role as long-range artillery. While Army leaders recognized the theoretical potential of long-range bombardment, the French general staffs valued the more tangible direct influence of bombardment aviation that obtained when the ground commander exercised control of aerial bombardment missions.

The physical characteristics of the World War I battlefield tied aerostation, or balloon observation aviation, more closely to the missions of tactical-level ground units

¹¹ HRA File 248.262-13, “Bombardment Aviation: Roles and Missions,”: 29.

¹² Ibid.

than any other air service mission except for anti-aircraft defense. Army commanders assigned aerostation units missions similar to those performed by observation aviation. The primary task of balloon units was to observe the battle area in the immediate proximity of ground forces. Observers kept watch for enemy assaults, adjusted friendly artillery fire, and directed the efforts of anti-aircraft artillery units. From the Army's perspective, aerostation was difficult, if not impossible, to employ effectively in a war of movement or where foliage and terrain shielded enemy movements. The Air Force regarded aerostation units as easy prey for prowling enemy pursuit planes. To protect the courageous, but highly vulnerable balloonists air planners had to strengthen anti-aircraft defense units and increase the number and frequency of pursuit patrols. Thus, the Army's reliance on aerostation for close observation of enemy maneuver along the front limited the range and freedom of pursuit units.¹³

Anti-aircraft defense was the last mission French doctrine identified for aviation during and immediately after World War I. Defensive Counter Air (D.C.A.) missions fell into two categories: a) surveillance and reconnaissance, and b) protection. In the surveillance role, D.C.A. units collected information on enemy aerial movements and forwarded that information to higher-level headquarters. Higher command echelons used the information to alert anti-aircraft batteries, direct fire missions, or launch pursuit aircraft to intercept enemy flights. Protection missions consisted of direct measures to counter enemy aviation or balloon operations.¹⁴

¹³ HRA, File 248.262-13, "Aerostation," 33-41.

¹⁴ HRA, File 248.262-13, "Anti-Aircraft Defense," 41-48.

As aviation technology advanced during the 1920s, French military professionals continued to speculate about the best way to integrate air power into the all-important land battle. One author asked if “deep aerial attack will be suffered by all, and through massive bombardment of what one may call ‘vital centers’ of the enemy nation, will air power be capable of ending a war in its early days and of halting the progress of the army’s heavy war machines?”¹⁵ Even with the technical progress of the 1920s, the author concluded that such an outcome was impossible. Air forces, like navies, were expensive institutions to create and to maintain and one of the characteristics of airpower recognized by land and air specialists alike was that there would never be enough aviation assets to go around. Moreover, the large number of targets in the ‘vital centers’ of an enemy nation precluded a rapid end to a war solely through aerial attacks. Finally, according to the author, the key lesson from the Great War was that “the war depends upon the armies on the march.”¹⁶

Early interwar studies of how air power developed during the Great War spanned a continuum that included, on one hand, unabashed optimism about aviation’s revolutionary impact on the conduct of war and hyper-conservative caution on the other hand. One author remarked that the experiences of World War I proved that even a small force of 200 planes “could in three missions destroy, or at least seriously disorganize three divisions.” The effects of this aerial coup would directly benefit the army by

¹⁵ S.H.A.A., Série 2B, Carton 109, École Supérieure de Guerre, “Notes sur l’Emploi de l’Aéronautique par le Commandement, 1928-1929,” *Cours Aéronautique* (Rambouillet: Imprimerie Pierre Le Roy, n.d.): iii.

¹⁶ Ibid.

“creating [at least] three important breaches that the cavalry may easily use to great benefit.”¹⁷

Some air power advocates interpreted the historical evidence from the Great War as promise of greater contributions from aerial attacks, despite the pervasive memories of the stalemated front that dominated French perceptions of future wars. In 1925, Major (later General) Keller acknowledged the supporting role assigned to aviation in the “unified battle.” Yet, he refused to limit his vision of aviation’s potential to reach beyond the land-bound armies. According to Keller, aviation should “take flight and go far from the battle to throw the weight of its bombs to shift the balance of the attack against the sources of enemy supplies in order to triumph over economic and moral factors which are indispensable to success.”¹⁸

The problem airmen encountered when searching for war-winning formulas based on political, economic, and moral effects lay in the difficulty in measuring the efficiency of such efforts against desired results. Although Keller and other like-minded aviators may have hoped to expand the role and prestige of the air arm by extrapolating air theory from the limited experience of the war, others countered that aviation had done little material damage to German industry or morale. This position found its way into the service regulations and there assumed the air of dogma. As one author wrote, “the moral

¹⁷ Capitaine de Réserve Waldemar Pfeiffer, “Formation de marche et action de l’aviation: D’après les expériences de la guerre,” *Revue de l’Aéronautique Militaire* 23 (Sep-Oct, 1924): 108.

¹⁸ Chef de Bataillon breveté Keller, “L’aviation dans la bataille,” *Revue de l’Aéronautique Militaire*, 27 (May-Jun, 1925), 49. Keller later served in the Personnel and Operations Directorates of the Air Staff. He chaired the committee assigned responsibility for producing the 1937 defensive aviation (*aviation légère de défense*) doctrine manual under Pierre Cot’s first air ministry.

effects and tactical results of aerial bombardment...are hardly proportional to the deadly effect of bombs...therefore, the material efficiency of bombardment is, in every case, the first result to seek.”¹⁹ After examining the results of World War I bombing missions, conservative strategists concluded that support for operations along the front represented the best use of bombardment aviation. The appropriate targets were men and material, not industries and morale.

After 1928, the focus of articles about the World War I experience in the aviation branch journals changed from one of trying to distill knowledge and principles about air warfare to one of chronicling how aviation performed in various battles and operations. This new trend in professional writing about the war reinforced the Army’s view that the proper role for aviation remained the support of land operations—primarily through aerial observation and the missions that supported air superiority over the battlefield. To support this thesis, authors concentrated on the campaigns that occurred early in the war. The months of August and September 1914 witnessed significant aviation action along several areas of the frontier as aerial observers provided timely intelligence information about German movements. Studies of the early months of the war also emphasized the limited striking power of aviation owing to the lack of technological sophistication in military aircraft and armament used by the combatants. Viewed in the context of evolving French defensive doctrines, the critical contributions of air power that allowed Army commanders to shift forces and to help prevent a disastrous breakthrough promised to help save the day once again if Germany made

¹⁹ Colonel Félix Marie, “Du bombardement par avion,” *Revue de l’Aéronautique Militaire* 30 (Nov-Dec, 1925): 139.

another attempt to conquer the Metropole.²⁰

French strategic air power advocates refused, however, to concede the field to their army cooperation brethren. One author asked plaintively if it was “permitted to consider the [independent] Air Division as an organism capable of playing a strategic role under the direction of the High Command?”²¹ But the combined-arms paradigm that forced the *Aéronautique Militaire* into a primary role as a supporting arm compelled even this argumentative author to structure his ideas about air warfare in terms of the “battle of arms” in which observation, pursuit, and bombardment assumed roles similar to cavalry, infantry, and artillery. The Air Division, despite its potential to achieve strategic effects, remained tied to the land battle and was “best articulated with a packet of pursuit to the East, a packet of bombardment in the center, and a packet of pursuit on the left.”²²

As the 1930s dawned, the French government began to consider the role that air forces should play in national strategy. This caused changes in service organization and

²⁰ Several articles focused on studies of the operations in 1914 in the late 1920s. See for example Lieutenant-Colonel breveté M. Blaise, “L’Expérience de la Guerre: L’Exploration Aérienne à la III^e Armée en Août et Septembre 1914,” *Revue de l’Aéronautique Militaire* 43 (Jan-Feb, 1928): 21-31; 45 (May-Jun, 1928): 71-75; 47 (Sep-Oct, 1928): 125-130; 48 (Nov-Dec, 1928): 147-154; and *Revue des Forces Aériennes* 1 (Aug 1929): 1-41. Général Paul Armengaud, “L’Aviation et la conduite de la manoeuvre et de la bataille: Morhange,” *Revue des Forces Aériennes* 8 (Mar 1930): 261-300. Colonel breveté Guillemeney, “L’aviation et les services de renseignements dans une guerre moderne,” *Revue des Forces Aériennes* 11 (Jun 1930): 645-683. Colonel Voisin, “L’exploration aérienne à la Ve Armée jusqu’à la veille de Charleroi (21 Août 1914),” *Revue des Forces Aériennes* 12 (July 1930): 760-784; 13 (Aug 1930): 891-926. Général Paul Armengaud, “Aviation and Manoeuvre d’aile et de dislocation: La manoeuvre et la bataille de la Marne et de l’Oureq,” *Revue des Forces Aériennes* 14 (Sep 1930): 1000-1046.

²¹ Commandant H. Langerin, “Action de masse aérienne dans une bataille défensive,” *Revue des Forces Aériennes* 6 (Jan 1930): 21.

²² *Ibid.*, 61.

doctrines as aviation assumed greater importance. The *Aéronautique Militaire*, the aviation branch of the Army, became the *Forces Aériennes* to indicate the unique contributions that air power brought to the military-strategic mix. Later, in 1933, the service completed the transformation from combat branch to independent service when the *Forces Aériennes* became *l'Armée de l'Air*.²³ As the debates about service independence and the proper role for the new service occurred, airmen turned once again to the Great War to find historical models for how best to employ aviation in an independent role. In this case, the campaigns of 1918 furnished the best evidence for authors to argue for the independent, offensive use of air power.

One of the best examples of a study that showed the efforts to achieve strategic effects, effects aimed at the war-making potential of the enemy rather than at the forces engaged on the operational or tactical fronts, was a study of an air campaign proposed in July of 1917. The premise for the proposal stemmed from the unfortunate geographical situation that prevails in northeastern France. As the author of the air campaign expressed, "[t]he most powerful factor of German resistance is his current possession of the iron in the Lorraine and Luxembourg regions, from which he draws 76% of his war material consumption, his naval and railway construction."²⁴ Much of the coal, iron ore,

²³ See Robert W. Krauskopf, "French Air Power Policy, 1919-1939" (Ph. D. diss., Georgetown University, 1965): 30-37. Charles Christienne and Pierre Lissarague, *A History of French Military Aviation*, trans. Francis Kianka (Washington, DC: Smithsonian Institution Press, 1986): 241-250.

²⁴ Colonel breveté Guillemeney, "Le bombardement aérien des installations industrielles. Le blocus du bassin de Briey," *Revue des Forces Aériennes* 15 (Oct 1930): 1163. This was by no means the only example of a strategic air campaign plan from the First World War. The British, for example, devised a plan to launch deep attacks against German industry. American planners also hoped to create havoc in German industries to hasten

and related industries are near the German border. When the fronts stabilized in 1914, much of this industrial potential fell into German hands.

The central idea behind this strategic campaign involved an attempt to isolate the critical mineral resources in the region from German exploitation by interdicting the rail traffic that carried coal and iron ore to foundries in the Saar, the Ruhr, and other parts of Germany. The French air strategists determined that marshaling yards at Thionville, Luxembourg, Woippy, Athus, Pétange, Conflans, and Longuyon, all within 40 kilometers of each other and within 100 kilometers of French airfields, represented the critical choke points that serviced this industry. The key to success, according to the air planners was to throw the entire weight of the night heavy bombardment forces into the effort against the marshaling yards. By doing so, "one could seek not only their disruption, but their annihilation through massive heavy bombardment."²⁵ By selecting a few critical targets and applying the principle of massed aerial attack over a sustained period, airmen hoped to deal German war industry a crippling blow.

Unfortunately, the raids failed to produce the anticipated results. This was due in part to a combination of poor navigation techniques, bad weather, bombing errors, enemy countermeasures, and repair efforts. The greatest flaw in the execution of the campaign, however, was the gross underestimation of the tonnage required to achieve the desired effects. Each mission only carried an average of eight bombs, and aircrews rarely delivered all their ordnance on the assigned targets. The failure of the French High

the end of the war. See HRA, File 248.222-78, Edgar S. Gorrell, "The Future of American Bombardment Aviation," 1917.

²⁵ Colonel breveté Guillemeney, "Le bombardement aérien des installations industrielles. Le blocus du bassin de Briey," *Revue des Forces Aériennes* 15 (Oct 1930): 1166.

Command to approve the all-out effort envisioned by the airmen compounded the problems. From January to October 1918, the air service launched only ten missions against the railyards at Thionville, the most important of the seven target sets. Additionally, there was a two-month gap between each raid against Thionville. This allowed German repair crews ample time to restore any damaged facilities to full operation.²⁶

In 1930, aviators seized upon the potential represented by this campaign to justify increased reliance on air power. Despite the lack of tangible results against the iron ore transportation system in 1918, airmen concluded "the attack of economic objectives could prevail in the period of cover [*couverture*] and concentration, during stabilization when the land operations lose their importance, and toward the end of an armed conflict, to definitively overcome the morale of the enemy population and government."²⁷

French airmen studied the aviation experience of the First World War to distill air power doctrine in the 1920s and 1930s. Under the tutelage of their land service comrades they adopted a philosophy, for most of the 1920s, that the proper role for air forces was to support the objectives and actions of army commanders. As the 1930s brought glimpses of strategic uncertainty, however, aviators reexamined the ways that air power had contributed to the campaigns of 1918. The result was a realization that, even if France adopted a vision of aviation employment that tied the air arm to battlefield operations, other nations would most likely exploit all the possibilities of air power. The debate for the 1930s centered around how to reconcile the army's need for aviation with the

²⁶ Ibid., 1182.

²⁷ Ibid., 1188-1199.

increasingly real possibilities that air forces could provide in terms of speed and striking power.²⁸

AIR POWER CONTRIBUTIONS IN THE RIF WAR

In the 1920s, the air service remained a combatant arm of the Army. Army leaders saw little potential for revolutionary developments in aviation, especially with the limited technology of the day. Yet, French airmen were among the few aviators to gain valuable combat experience in the 1920s that heralded a new age for aerial warfare. In 1925, the insurrection that had smoldered in the Moroccan Protectorate for more than ten years burst into full-fledged war as rebel forces under the leadership of Abd-el Krim mounted an offensive that threatened to push lightly manned French garrisons out of the country. While Resident General Marshal Hubert Lyautey shifted his mobile columns to counter Krim's incursions, his aviation commander, General Paul Armengaud, deftly responded with air evacuation of wounded soldiers, aerial bombardment, close air support, reconnaissance and observation, and aerial supply. By blocking the path to Fez, the capital, French troops, supported by air forces, prevented Krim's efforts to rally larger numbers to his cause. Lyautey, who advocated a broader role for air power in colonial operations as early as 1912, credited Armengaud's 37th Aviation Regiment with saving

²⁸ Army commanders feared the loss of control that independent air operations implied. Airmen, too, understood this danger. General Voisin wrote that "independent aviation, as an intangible block, not placing all or part of its forces at the disposition of the Armées, but above them, is an idea which produces a divergence of efforts and duality of command, both difficult to reconcile with the principle of the liaison of arms." See Général Voisin, "La doctrine de l'aviation française de combat en 1918: L'aviation de combat indépendante," *Revue des Forces Aériennes* 28 (Nov 1931): 1300.

the French cause.²⁹

When viewed from a British perspective that emphasized the primacy of independent air operations, the performance of the French air service in the Moroccan Rif War of 1925 appeared lackluster. According to one British analyst, "the offensive power of the air forces was entirely unappreciated or completely ignored."³⁰ The cooperative role officially assigned to the French colonial air arm served as ammunition for those who thought that air power was best applied under the aegis of army commanders. From the French perspective, however, the Rif War represented significant progress and innovation from the World War I paradigm of aviation employment. Airmen gained credibility and increased autonomy while they showed that, when properly applied under the command of a knowledgeable airman, aviation could become the primary weapon used to accomplish strategic objectives.

French colonial aviators brought the assumptions of continental doctrine to the colonial administration task. The metropolitan influence was evident in one Tunisian aviator's description of the air force role in 1921: Aviation was "1) to cooperate in the surveillance of the Saharan confines;...2) to constitute a force at the disposition of the Commander, in case of insurrectionist troubles in the interior of the Regency; 3) to prepare personnel for their wartime role, either in exterior theaters, or in metropolitan theaters."³¹ Despite this conservative description of the potential for aviation to

²⁹ See André Le Révérend, *Lyautey* (Paris: Fayard, 1983).

³⁰ Wing Commander R.H.M.S. Saundby, "Small Wars—Summing Up," (RAF Staff College, 14th Course: Andover, 26 June 1936): 5.

³¹ Commandant de la Fargue, "L'Aviation Militaire en Tunisie: Historique—Rôle (1916-1920)," *Revue d'Aeronautique Militaire* 3(May-June 1921): 57.

contribute to colonial security, the North African environment quickly forced French airmen to reassess their relationship to colonial land forces and to other colonial institutions. For example, the pursuit mission was superfluous because the North African tribes that fought against the French armed forces had no airplanes. Additionally, the aerostation mission proved cumbersome and ineffective because of rugged terrain and the highly mobile nature of colonial warfare.

Aviation leaders emphasized how the air arm supported army pacification operations. The air service participated in the French Protectorate Administration in Morocco from the outset by providing territorial reconnaissance and surveillance of insurgent and tribal movements. Aviators carefully advertised aviation's unique institutional characteristics, but in a way that did not threaten the primacy of, or criticize the contributions of the larger institution of the Army. In the process of refining the institutional characteristics that eventually set the air service apart from other Moroccan institutions, aviators drew upon the values, goals, and institutions of the Protectorate government rather than upon those of the Army. These values, goals, and institutions evolved under the influence of a particular colonial philosophy promoted by Marshal Lyautey and under conditions of conflict between Moroccan and French societies.³²

The Agadir Crisis of 1911 culminated more than half a century of French maneuvering for access to Moroccan territory. Internal instability and extensive French debt had provided the justification for French intervention in the Sultanate. French

³² For a thorough analysis of Lyautey's methods of colonization see William A. Hoisington Jr., *Lyautey and the French Conquest of Morocco* (New York: St. Martin's Press, 1995).

leaders judged Moroccan society as always on the edge of anarchy because of the chaos caused by the sultan's economic policies, the nomadic nature of the tribes, and the native willingness to resort to violence to avenge even the smallest insult.³³ The settlement of the Agadir Crisis divided African territory between France, Spain, and Germany, with France gaining a free hand in Morocco. The French government assumed the responsibilities of protector and signed the Treaty of Fez in 1912 formalizing the relationship. Paris chose Marshal Hubert Lyautey to administer the country as Resident General.³⁴

Lyautey was an outspoken, self-styled expert on colonial administration. He served under General Galliéni in Madagascar and Indochina and became familiar with Galliéni's ideas on colonial administration, but he developed his own theories of colonization. He served as Resident General of Morocco from 1912 until 1925 when opposition to his policies at home and the Rif War in Morocco prompted the government in Paris to relieve him in favor of a more politically malleable successor.³⁵

³³ Henri Busson, Joseph Fèvre, and Henri Hauser, *La France d'aujourd'hui et ses Colonies*. (Paris: Librairie Félix Alcan, 1920). On page 530, the authors quote Eugène Aubin as an expert on Moroccan society. "In reality, the Moroccan Empire was a *fédération vague*, encompassing a great number of tribes and divisions, some of them tiny; each of these organisms possessed its own constitution, each of them guarded, above all, jealousy of its independence, and desired, to conserve it, keeping the country at the edge of anarchy."

³⁴ See Dwight L. Ling, *Morocco and Tunisia: A Comparative History* (Washington, D.C.: University Press of America, 1979), Chapter 3. See also, Paul S. Reinsch, *Colonial Government: An Introduction to the Study of Colonial Institutions* (New York: The MacMillan Company, 1916) especially Chapter 8 for an introduction of the distinctions between Protectorate governments and other forms of colonial government.

³⁵ See Barnett Singer, "Lyautey: An Interpretation of the Man and French Imperialism," *Journal of Contemporary History* 26 (1991): 131-157. Marshal Philippe Pétain temporarily assumed control of military operations in the Protectorate after the Rif rebellion cooled.

Lyautey preferred to maintain the semblance of a degree of partnership between the French rulers and their Moroccan subjects. He regarded the Sultan and his representatives as legitimate, although junior partners in ruling the territory. In the Resident General's view, Morocco's main enemy was instability, and although he preferred to use peaceful methods to introduce French civilization to Morocco, he was prepared to respond with violent military measures, including aerial bombardment of civilian areas. French officials tolerated dissent from the Moroccan natives only within strictly defined boundaries.

Aviation provided economy of force advantages that were important not only in the colonial environment in which ground forces in isolated outposts guarded vast stretches of territory, but also in the postwar metropole, which did not look favorably on costly military expenditures. Lyautey petitioned the War Ministry in June 1914 for more powerful aircraft engines for his observation airplanes and, more importantly for an airman, "*un Officier spécialiste de la direction de l'Aéronautique*," to manage the aviation effort.³⁶ In contrast to the limited effects envisioned for air power in a continental war, aviation's rapid response capability and long reach delivered material destruction and great psychological dislocation in colonial warfare. In areas where tribal insurrection flared up, according to Commandant Barthelemy, an aviator with extensive experience in Morocco, "the arrival of airplanes going to bombard and strafe the enemy...never fails to return calm rapidly to the rebellious regions."³⁷

³⁶ Service Historique de l'Armée de l'Air, Série C2A, Carton 34, Item 21, Letter from Lyautey to the Ministre de la Guerre, 12 June 1914: 3.

³⁷ Commandant Barthelemy, "L'Aviation dans l'Afrique du Nord," *Revue de l'Aéronautique Militaire* 1 (Jan-Feb 1921): 9.

The regular movement of tribes and their herds between mountain and valley grazing areas represented a significant source of instability that complicated French attempts to subdue the countryside. Control of the movements of the nomadic tribes became a central issue in the efforts of the French to claim fertile pastures for systematic farming. Air power supported efforts to control these seasonal migrations by monitoring the traditional routes taken by the tribes and their herds. Commandant Cheutin, Commander of Morocco's 37th Aviation Regiment from 1918 to 1925, reported "aviation greatly assisted the interdiction of nomads from the mountains down to the plains by maintaining surveillance and directing ground units to intercept the nomads. Without aviation, *the army could not perform its assigned mission.*"³⁸ Cheutin's description of this mission revealed his identification with the goals and values of the protectorate rather than a mission orientation toward army tasks.

Rabat became the nerve center that shaped the character for the emerging air service institution. Commandant Cheutin lobbied successfully to locate the regimental Headquarters at Rabat, "close to the Marshal, the Directorate of Information, and the main Protectorate services." The proximity to Lyautey's headquarters and center of colonial government allowed the aviation commander to advise the Resident General on how best to employ the air force to accomplish colonial objectives. Cheutin wrote that "[t]he Moroccan Aviation Commander is, of course, the technical advisor to the Commander-in-Chief."³⁹ This informal structure, however, led to the arrangement of a

³⁸ Commandant Cheutin, "Rôle Colonial de l'Aviation Militaire au Maroc," *Revue de l'Aéronautique Militaire* 4 (Jul-Aug 1921): 89. [emphasis added]

³⁹ Ibid.

formal chain of command in which the aviation commander became an equal participant in protectorate strategy councils. The air commander exercised autonomy by intervening in the chain of command between individual ground commanders and the aviation squadron commanders. Cheutin expressed his pride that "Group commanders have full authority over their squadrons." He went on to comment that "from the point of view of instruction, discipline and use. . .they maintain a close link with the commander of the Intelligence Service and insure that the squadron bases and emergency landing fields are always in good condition."⁴⁰

The independence from land service interference that resulted from the Protectorate command arrangements filtered down to the Aviation Group and Squadron levels in the form of responsibilities that included more than just flying missions assigned by Army staffs. Moroccan air service leaders held squadron commanders responsible "not only for the administration and instruction of personnel, the maintenance of equipment, but also to take part. . .in important combat operations."⁴¹ This command structure represented a significant departure from that of the World War in which the ground commanders exercised rigid control over all aspects of the aviation mission. Air service leaders selected sites for airfields to accomplish the objectives of protectorate strategy, rather than to support specific ground operations. When required, squadrons deployed to areas that were closer to the action in order to support outposts engaged in combating insurgents.

⁴⁰ Ibid.

⁴¹ Barthelemy. "L'Aviation dans l'Afrique du Nord," *Revue de l'Aéronautique Militaire*, 1 (January-February, 1921): 102-103.

The ability of the air service to evacuate wounded and sick personnel also enhanced the prestige of the emerging institution among the leaders of the Army and the Protectorate government. Colonial aviators pioneered aeromedical evacuation, and by 1925, the Moroccan air service included airplanes dedicated to the aeromedical evacuation mission. Because of the demands of this mission, air service and medical personnel cooperated to suggest the development of specially designed airplanes (the *Breugot 14-T bis*). This airplane allowed for increased safety and better care of wounded and sick personnel during transport. Aviators allied themselves with representatives in the medical field to formulate rules for this new role. These rules included setting up of airfields near well-equipped hospitals, criteria for selecting personnel for aerial transport based on critical medical treatment needs, the safest altitudes for transport (owing to the effects of flying in unpressurized airplanes), and specialized training requirements for flight crews assigned to transport wounded and sick personnel.⁴²

The European doctrine that subordinated aviation to the ground commanders proved impractical and inefficient in the fluid environment of colonial warfare. The continental system that evolved during World War I was effective in combat between symmetrical military opponents where the war aims were relatively unlimited. In the limited war that prevailed in the colonies, against enemies employing asymmetrical forces and strategies, options for using force required more sophistication and careful study.

⁴² Médecin-Major Gravellat, "L'Aviation sanitaire aux Colonies," *Revue de l'Aéronautique Militaire* 18 (November-December, 1923): 122-124. See also Capitaine W. Breyton, "L'Aviation Sanitaire au Maroc en 1933," *Revue de l'Armée de l'Air* 56 (Mar 1934): 243-264.

Lyautey and his administration assigned aviation missions to the 37th Aviation Regiment that reflected the new institutional character of aviation and the difference between the European and colonial tactical environments. In 1924, the Regimental Commander declared that “aviation acting *alone* fills the following missions: reconnaissance, bombardment, liaison and transport, artillery adjustment, medical transport, and *various missions of interest to the civil and military organizations of the Protectorate.*”⁴³

Bombardment aviation experienced a significant change, in terms of expectations, from the World War I paradigm. Rather than the physical destruction of property and personnel, aviators connected the results of bombardment missions to Lyautey’s desire to convert the natives to the French cause. This represented a dramatic break with earlier ideas about the efficacy of bombardment to influence enemy morale. During pacification operations, Cheutin followed Lyautey’s doctrine and discouraged indiscriminate killing and destruction. He explained that “the end sought after is evidently not to kill many of the dissidents, but to bring about their rapid surrender, since on the day they have accepted [French rule]. . .they become allies of fidelity and devotion beyond reproach.”⁴⁴

By 1924, members of the 37th Aviation Regiment aligned air service values in Morocco with Lyautey’s economic and social stability goals. The range, speed and quick response capability air power provided allowed French forces to “assure the security of

⁴³ Lieutenant Colonel Cheutin, “L’Aviation française au Maroc: Emploi de l’Aviation au Maroc.” *Revue de l’Aéronautique Militaire* 19 (Jan-Feb 1924): 6. [emphasis added]

⁴⁴ Ibid.

the country with minimum troops.”⁴⁵ In contrast to the description of the limited role of aviation in colonial operations presented earlier, by 1924 the air service leader proclaimed that “Moroccan aviation [played] an important role in: a) the preparation of operations; b) participation in combat; c) the exploitation of success.”⁴⁶ Rather than speaking to the Resident General through the ground commander, the Aviation Regiment Commander advised the Commander-in-Chief on all aspects of aviation employment at the highest levels of Protectorate Government.

The Rif War served as the catalyst for accelerating the development of the separate institutional identity of the Moroccan air force. Aviators did not energetically push their case until the Protectorate faced the Riffian attack toward Fez in 1925. During and after the Rif War operations, air service personnel confidently advertised air power effectiveness as a rationale for recognizing aviation as a separate institution by Army and Protectorate leaders.⁴⁷ Aviators applied the tactics and operational concepts that evolved since 1920 to defend the larger institutions of the Army and the Protectorate. As the Riffian threat heightened tensions in the Protectorate, the members of the aviation community developed greater confidence in the doctrinal changes that applied to the Moroccan environment.

The coalition of northern tribes led by Abd el-Krim had battled Spanish forces for control of northern Morocco since 1919. Krim sought to “create a republic with a

⁴⁵ Commandant Cheutin, “L’Aviation française au Maroc: Emploi de l’Aviation au Maroc,” *Revue de l’Aéronautique Militaire* 19 (January-February 1924): 1-6.

⁴⁶ Ibid.

⁴⁷ For an analysis of Abd el-Krim’s political goals, see: Shannon E. Fleming, *Primo de Rivera and Abd el-Krim: The Struggle in Spanish Morocco, 1923-1927* (New York: Garland Publishing, Inc., 1991).

resolute government, firm sovereignty and a strong national organization which was to be a modern state like France and Spain, but of course an Islamic one.”⁴⁸ By 1924, Spanish military incompetence coupled with Riffian fighting skill and knowledge of the terrain had resulted in a decisive defeat of the Spanish army.

Lyautey recognized the threat posed by the Riffian tribes and positioned his mobile groups to deal with attacks into the French zone. His “stick and carrot” strategy of using small units to pacify local tribes and to begin economic development remained unaltered despite the insurgents’ growing confidence after the defeat of the Spanish. Because of Lyautey’s reliance on a thin line of lightly fortified outposts, French forces were extremely vulnerable to attacks all along the northern zone claimed by Krim’s Rif Republic.

The Riffian tribes attacked the northern sectors of French Morocco in April 1925. Krim’s hard-fighting rebels quickly surrounded or defeated Lyautey’s troops in their isolated outposts. Despite the early Riffian successes, Lyatuey remained confident in his pacification strategy. He had little choice, in fact, because he lacked the forces to remove the rebel threat by permanently occupying all of northern Morocco. More importantly, he did not want to subject the Moroccan economy to the ravages of an all-out war. He wrote that “the power and danger of Abd el-Krim as well as his stated ambitions are incontestable; there are, nevertheless, fissures, divisions and weak points on which action backed up by and advised by political measures, that I have already begun, could easily

⁴⁸ C. R. Pennell, “Ideology and Practical Politics: A Case Study of the Rif War in Morocco, 1921-1926,” *International Journal of Middle East Studies* 14 (1982): 21.

intervene.”⁴⁹ Given the Resident General’s preference for political and economic strategies, and the distance between the French outposts and their reinforcements, aviation became his primary weapon to stabilize the front and set the stage for the counteroffensive.

Aviators assessed the situation somewhat differently than the Resident General. The change in the situation from day-to-day pacification operations signaled a new role for aviation that essentially revolved around the need to preserve the security of Protectorate territory from an external threat. One aviator described the situation at the beginning of the rebel advance: “Along a front of more than 100^{km} the danger is everywhere, there are no reserves. . .the command is severed from its outposts and cover. The true reserve, the only reserve capable of maneuvering in this pitiful condition, is aviation.”⁵⁰ This assessment of the situation reflects the grim nature of French military prospects at the beginning of the Rif War. It also indicates, however, the realization of air service personnel that their institution deserved respect based on the ability of air power to contribute to the defense of the protectorate.

As the rebel offensive unfolded, Lyautey adjusted his strategy by choosing which key outposts he would defend. He ordered troops in selected outposts to hold their positions, and organized the remainder of his forces for an eventual counterattack. The fourteen air service squadrons assigned to the northern front assumed the responsibility

⁴⁹ Simone Pesquies, “L’aéronautique militaire française dans la guerre du Rif,” *Revue du Nord* 72 (1990): 317-367.

⁵⁰ “Emploi de l’Aviation au Maroc en 1925: Aperçu général de la campagne—Ses trois grandes phases,” *Revue de l’Aéronautique Militaire* 33 (May-Jun 1926): 58.

for preventing further loss of territory. Lyautey charged the 37th Aviation Regiment with the following missions:

- discover and track the enemy line of advance;
- develop bombardment objectives;
- attack targets with bombs and machine guns;
- resupply and protect surrounded outposts;
- assure the safety of mobile columns;
- participate in combat.⁵¹

Although listed fourth on the mission priority list, the importance of the mission to resupply and protect the surrounded outposts cannot be overstated in terms of the prestige of the air service's independent institutional identity.

Because they usually relied on regular supply columns, French troops in the surrounded forts quickly consumed supplies of food and water when the Riffians attacked. The pressure of determined rebel attacks also caused the troops to use ammunition at increased rates. Aviators understood the plight of their comrades and devised emergency measures to keep the French lines from collapsing entirely. Aviators communicated with outpost commanders by radio, visual signal, or if possible by landing (often in the face of intense small arms fire from rebel forces) to deliver supplies and pick up the commander's dispatches.

The experience of the outpost at Alouaï illustrated the value of aviation to these installations during the critical period of the war. For four days (3-6 May) the post commander signaled to pilots, "We are encircled, we are under attack." The aviation commander stepped up bombardment missions to the area to attack rebel 75mm artillery

⁵¹ Ibid., 38. See also, "Emploi de l'aviation au Maroc en 1925: Aperçu général de la campagne—Ses trois grandes phases," *Revue de l'Aéronautique Militaire* 32 (Mar-Apr 1926): 37.

pieces that fired on the interior of the compound. On the 8th of May, the surrounded post signaled that the "Situation is grave—losses exceed more than one-third of effective personnel—Help us—We are under attack." Aviators increased the degree and frequency of the bombardment missions so that by the afternoon of the eighth the sector commander sent the following message: "Excellent work by aviation in checking the intense attack on Aoulaï, enemy artillery has been quiet since 8:30 a.m. Harassment of the enemy by aviation should continue until nightfall to prevent enemy movement and artillery adjustment before morning."⁵²

Although aviation could assist soldiers in the fortified positions with keeping enemy forces at bay, time was not on the side of the French soldiers when it came to food, water and ammunition. The demands for succor in the face of enemy artillery and infantry attack became even more urgent when soldiers confronted thirst and starvation. Aerial bombardment had not broken the siege at Alouaï, and the commander signaled on the 12th of May that "We have water for less than four days—Help us." Airplanes, flying at extremely low altitudes were able to drop supplies into the compound that allowed the surrounded soldiers to maintain their defenses. A relief column arrived on May 15 to lift the siege and drive the rebel forces away. In all likelihood, the survivors of the siege of Alouaï did not echo the signal from the mobile group commander in charge of the relief column to airplanes flying overhead that "We no longer need you."⁵³

In retrospect, Lyautey's strategy of applying political and economic pressure

⁵² "Emploi de l'aviation au Maroc en 1925: Aperçu général de la campagne—Ses trois grandes phases," *Revue de l'Aéronautique Militaire* 32 (Mar-Apr 1926): 38.

⁵³ *Ibid.*, 39.

against Abd el-Krim's Rif Republic worked. Lyautey's opponents in France, however, used the crisis to have him removed to open the door for harsher colonial policies toward Morocco's native peoples. Aviators judged their performance in the emergency and concluded

"The campaign proves clearly how and how much aviation can help Morocco, to begin the work of the other arms and in the conquest of the land. . . The coming months will show that it is capable of giving results of another type: aiding in the peaceful conquest by the sugar and whip method, aviation perhaps being the better whip."⁵⁴

By the spring of 1926, Abd el-Krim surrendered in the face of a French combined air-ground campaign. The French Government replaced Lyautey the preceding fall, but the institutional relationships he allowed to develop and flourish between the air service, the army, and the protectorate government remained. The immediate concern for the colonial forces after the capture of Abd el-Krim was to pacify the remaining dissident tribes. Airmen and soldiers viewed this as a return to the pacification and social programs that they had engaged in since 1920. Because of the air service's support for economic development and territorial security the colonial government and the army granted it *de facto* recognition as an independent institution.

To protect and enhance hard-won institutional prestige and autonomy, aviation leaders emphasized what air power could do, not what it might be able to do. Colonel Armengaud, who replaced Cheutin as 37th Aviation Regiment Commander only months before the Rif War flared, reported to Lyautey that "aviation, as powerful as it can be, cannot achieve victory by itself. It can prepare for it, but the land should be effectively

⁵⁴ "Emploi de l'aviation au Maroc en 1925: Aperçu général de la campagne—Ses trois grandes phases," *Revue de l'Aéronautique Militaire* 33 (May-June, 1926): 61.

occupied.”⁵⁵ This concise statement reflected the real limits of aviation in the colonies. At the same time, Armengaud’s statement indicated his awareness that the institution provided a unique ability to support both security and economic development in the North African colony. Lyautey commended the 37th Aviation Regiment and confirmed the status of the air service as an independent institution within the Protectorate when he said that the “squadrons have greatly aided the programs of the operations groups and inspired the ground troops with a double measure of confidence, gratitude and admiration.”⁵⁶

Armengaud returned to France after the Rif War and added his voice to the growing debate over the organization and role of the air service in national defense. He published a study of aviation’s contribution to the Rif campaign in 1928 that distilled several lessons regarding air power for the public. Armengaud’s approach was to describe the operational conditions that prevailed in Morocco, then to transfer the lessons from the colonial context to a hypothetical European war. Those who argued that *la petite guerre* of the colonies held few lessons for *la grand guerre* on the continent missed a valuable opportunity to advance the body of military aviation knowledge according to Armengaud. The key to profiting from the lessons of the Rif War was to assess “in what measure those lessons would be valuable for a European war.”⁵⁷

The units of the 37th Aviation Regiment operated most effectively when

⁵⁵ Commandant Cheutin, “L’Aviation française au Maroc: Emploi de l’Aviation au Maroc,” *Revue de l’Aéronautique Militaire* 21 (May-Jun 1924): 56.

⁵⁶ Pesquies, “L’Aéronautique militaire française dans la guerre du Rif,” 356-357.

⁵⁷ Paul Armengaud, *Quelques Enseignements des Campagnes du Riff en Matière d’Aviation (1925-1926)* (Paris: Berger-Levrault, 1928): 1.

concentrated. In future European wars, Armengaud argued that enemy aviation would attempt to apply this principle to cover the mobilization and advance of the army and to strike a mortal blow against French aviation. Moreover, the numbers of airplanes nations would employ would continue to grow. He wrote, "The war in Morocco marked an evolution in the number of planes assigned to the units charged with assault missions."⁵⁸ The correct response to this troubling development would require a doctrinal change (*une nouvelle conception*). Aviation would best serve the war effort by concentrating rapidly and proceeding to the frontier ahead of the army. This was indeed a revolutionary proposal when considered in light of the World War I doctrine that relegated the aviation units to a subordinate role to the land commanders. What was more revolutionary, however, was the realization that the range and speed that were inherent characteristics of air power would insure that "the entry into the line of all aviation upon mobilization will be *quasi-immediate*."⁵⁹ Armengaud had opened the door for independent aerial action that could shape the course of the war effort.

To allow aviation units to range ahead of the armies required a new organization and command structure. In the first place, land commanders would find themselves preoccupied with the task of organizing large numbers of men and vast amounts of material before shifting to the task of moving their units into the battle line. To insist that aviation wait for the army commander could cost the nation valuable territory and resources. The answer, Armengaud argued, lay in the model that prevailed in Morocco in which the aviation commander reported independently to the Commander-in-Chief. But

⁵⁸ Ibid., 26.

⁵⁹ Ibid., 7.

to best employ air forces, the nation must grant airmen command authority. In the next European war, "the senior aviation commander should be the effective chief, not only of the general reserves, but of all of the available air power."⁶⁰

But how should air power contribute to the war effort if the front stabilized into a continuous battle line as it had done during the Great War? Armengaud found this question difficult to answer using the example of the Rif War. In the first place, few strategic targets supported the Riffian attack. Second, the critical need during the war was for close air support for the surrounded units and aerial interdiction of rebel supply lines. Finally, aviation technology had not progressed enough to support deep penetration of enemy rear areas. He had built a case that argued for an independent role for aviation, but his combat experience supported a close cooperative role. Armengaud related that air power had functioned in Morocco

"like a synthesis of the cavalryman, of the gunner and of the infantry machine-gunner. We will never forget our interview with Captain Duboin, the heroic and famous defender of Alouaï, on the day after his relief. He told us, and he has re-echoed it several times: 'I thought that I understood air power, I know today how much I misunderstood about it. What I have seen is a revelation for me. Air power is the synthesis of the three arms.'"⁶¹

Although he suggested that air power could have decisive strategic effects by intervening in the rear areas to instigate "terror, isolation, and the abandonment of towns," the need on the front was for a maximum effort to support army assaults.⁶² The answer was to employ air power as a flexible, independent arm that tailored combat power to the needs

⁶⁰ Ibid., 18.

⁶¹ Ibid., 60-61.

⁶² Ibid., 29.

of the theater.

Armengaud advocated strengthening the trend toward independent air operations based on his analysis of the successful experience in the Rif War. But he did not favor abandoning the army altogether. Army leaders would continue to need the benefits aviation provided, perhaps even more than in the Great War. While some in the aviation community pushed for independence and strategic bombing capability, others, like Armengaud, favored a more methodical approach that guaranteed their Army brethren the air support they needed. Nevertheless, both traditions, the subordinate role played by air power during the First World War and the cautious search for increased autonomy that derived from the Rif War, contributed to the reactive doctrine that would emerge in the 1930s and that the *Armée de l'Air* would ultimately carry into battle in 1940.

OTHER INFLUENCES ON AIR DOCTRINE

Institutional battles in the late 1920s and early 1930s also contributed to how the reactive air doctrine developed. The French government and the military struggled to define the most effective organizational scheme for the nation's military aviation. In 1928, the government established an Air Ministry to manage operations, training, and procurement matters. The decree that created the ministry failed, however, to grant full autonomy to the new institution. Land and naval commanders retained control of aviation units designed to cooperate with their combatant commands. Moreover, the law prevented the Air Minister from altering the structure or the deployment of aviation units

without prior approval from the Minister of War. The air service remained attached to the army by this umbilical for nearly five years.

The late 1920s and early 1930s witnessed a surge of technical developments in aviation. France's air industry was no exception to this phenomenon. Unfortunately, this period also witnessed the onset of the global economic crisis; the United States and other countries suffered first, but France too eventually felt the pinch of economic crisis. Fears for the economy coupled with an active disarmament movement served as a brake on modernization initiatives for the air force until the mid-1930s. Rather than adopt a focused aircraft procurement policy that linked assigned missions with technological capabilities, the Air Ministry opted to support aviation industries by pursuing a prototype procurement strategy (*la politique des prototypes*).⁶³ The philosophy behind this approach was that current aviation technology functioned well enough for present defense purposes. Additionally, aviation technology was changing so rapidly that politicians feared placing large orders for aircraft that were destined to become obsolete in the near future. Theoretically, the prototype policy allowed aviation contractors enough government business to remain solvent, while at the same time it promoted research to keep French aeronautical technology current with the latest engineering developments. Unfortunately, the result was that the air service spent the first half of the 1930s operating with aircraft that looked like and performed on par with those that had

⁶³ For an analysis of the procurement policies of this period see Thierry Vivier, *La Politique Aéronautique Militaire de la France, Janvier 1933-Septembre 1939* (Paris: L'Harmattan, 1997): 83-97.

flown in the First World War.⁶⁴

By 1933, the government decided to end the organizational and bureaucratic twilight zone that had plagued the air service since 1928. New presidential decrees awarded a higher degree of autonomy to the air service. At the same time a youthful professor of international law, Pierre Cot, took over as Air Minister. Cot expressed strong support for collective security under the aegis of the League of Nations; he also spoke out in favor of European disarmament. At the same time, however, he deeply distrusted Germany and the rising tide of fascism. Cot believed that the air force had the potential to provide European nations a common security blanket in the guise of an international reprisal force as they dismantled their dangerous land forces. The new Air Minister set out to reform the Air Ministry and to shape the character of the *Armée de l'Air*. He intended to reorganize the service to make it more effective as a war-fighting element of the defense establishment while simultaneously reforming procurement practices and modernizing equipment. Given the political culture of the Third Republic in the 1930s, it is no surprise that Cot's sweeping agenda achieved mixed results.

Cot faced a situation in which French strategy in Europe depended heavily on alliances with weaker countries in the East (Poland, Czechoslovakia, and Rumania in particular) to keep the threat of a resurgent Germany in check. The Army, for all practical purposes, abandoned hopes of launching offensives into Germany to relieve the

⁶⁴ The French were not alone in choosing to limit aircraft purchases to a few prototype models. United States Senator James Wadsworth commented that "the designers are registering tremendous improvements in every way and therefore we should hesitate before we purchase a large number of planes in any one year, lest we find that we have committed ourselves to the extent of our financial abilities to a type doomed to be outclassed." See Frank A. Tichenor, "Air—Hot and Otherwise: Propaganda vs. Patriotism," *Aero Digest* (July 1926): 239.

pressure on French allies in Eastern Europe, thus leaving the Air Force to represent the French determination to honor the treaties with the Eastern partners.⁶⁵ Unfortunately, when Cot took office the air service was ill prepared, either materially or doctrinally, to succor French allies by launching aerial strikes against Germany. To complicate matters further, Cot recognized that a war that began in the East could quickly turn on France in the West, thereby placing demands on the air service to provide air support for the army. He could not afford, therefore, to build a fleet of bombers designed to strike deep into Germany and the East at the expense of ground support, fighter, and reconnaissance aircraft. Even worse, by 1933 the effects of the Great Depression began to exert their full weight on the French economy after a deceptive grace period.⁶⁶ Weighing all these factors, Cot opted to jettison the *politique des prototypes* in favor of a plan to purchase a multi-place, multi-purpose aircraft—the “Bombardment Combat Reconnaissance,” or BCR. With such a vehicle, the independent air arm could meet the demands of economy, metropolitan defense, and collective security. Unfortunately, the BCR, an airplane designed to do everything, did nothing well.

Cot's tenure as Air Minister lasted until 1934 when his Chief of Staff, General Victor Denain, replaced him after the near-coup in February. Denain commanded respect

⁶⁵ On the development of French foreign policy see J.Néré, *The Foreign Policy of France from 1914 to 1945* trans.by Translance (London: Routledge and Keegan Paul, 1975). For the role of airpower in the alliance with Czechoslovakia see Thierry Vivier, “La coopération aéronautique franco-tchécoslovaque (janvier 1933-septembre 1938),” *Revue historique des armées* (Mar 1993): 70-79.

⁶⁶ For a concise development of the delayed economic effects of the Great Depression and its consequences for the rearmament effort see: Philippe Bernard and Henri Dubief, *The Decline of the Third Republic, 1914-1938* trans. Anthony Forster (Cambridge: Cambridge University Press, 1985).

with politicians and aviators alike. He was a veteran on the First World War who led the air effort against rebels in the Levant during the 1920s. As Air Minister, he pursued Cot's modernization plans thus providing much needed continuity and stability at the highest level of the service. Plan I, the production plan that Cot and Denain assembled, forecast the acquisition of 1,010 new airframes over a period of three years. From the outset Plan I met with difficulties. The aforementioned effects of the depression tightened the fists of the already parsimonious French legislators. Aircraft production plants experienced the atrophy that comes from long periods of little or no work. And Denain's initiative to pressure industry leaders to relocate important aircraft industries away from the Paris region, where they presented easy targets for enemy bombardment, to locations deeper in the nation's interior compounded production problems. Finally, in 1935, German rearmament and French fears of a war in 1936 prompted Denain to push for accelerating the production schedule of the plan; he cut the original optimistic timetable of three years to an impossible-to-achieve eighteen months.⁶⁷

After 1936, the French strategic position took on an increasing aura of emergency. Germany grew stronger, particularly with respect to air power, and the alliance systems in the East that once promised to draw the German menace away from metropolitan France began to evaporate. Denain's tactic of overestimating the German threat when addressing legislators in order to impart a sense of urgency for rearmament programs had the unfortunate effect of shaking public confidence in the readiness of French aviation. Moreover, the experience with Plan I exposed the French aircraft industry's dismal

⁶⁷ Patrick Facon, "Le plan I, 1933-1937: Aux origines du réarmement aérien," *Aviation Magazine* 747 (1 February, 1979): 86-91. Patrick Facon, "Le plan I, 1933-1937: Aux origines du réarmement aérien," *Aviation Magazine* 748 (15 February, 1979): 66-71.

inadequacy to the task of gearing the nation for war against a major air power. The Popular Front government that assumed the reigns of government in 1936 returned Pierre Cot to the air ministry. Cot resumed his duties determined to complete the initiatives he and Denain launched during his first term at the Air Ministry offices on the Boulevard Victor.⁶⁸

At Cot's urging, and with Prime Minister Léon Blum's support, the government passed a new law nationalizing the armaments industries. Cot used this new law to pressure reluctant manufacturers to modernize assembly processes and to relocate to more secure areas in the south and west. Not surprisingly, he failed to turn the industry around. Firms like Bréguet, Lioré and others resented the government's intrusion and lobbied aggressively to stop Cot's meddling. With the unwillingness or inability of French industries to meet demands for faster and better production results the government began to look overseas, particularly to the United States, for new airplanes.⁶⁹

While the Popular Front government struggled to cope with industrial concerns at home, international events diverted its attention and threatened to destroy the cohesion of the fragile Leftist coalition. The Spanish Civil War forced Blum to choose between Great Britain, France's most important ally against the German threat, and support for a Leftist government in Madrid. Cot pushed the government vigorously to support Spain's Republican government. He promised to deliver airplanes and logistical support to bolster the Spanish government's cause, but Blum bowed to pressure from the British abroad and the Right at home by declaring that France would remain neutral regarding

⁶⁸ Vivier, *La Politique Aéronautique Militaire de la France*.

⁶⁹ Ibid., 352-364.

Spanish problem. By choosing national interest over ideology, Blum proved that he was no slave to Socialist dogma. Unfortunately, French Communists viewed Blum's decision as a betrayal of the Popular Front ideal. Blum and Cot established a limited clandestine supply line of planes and supplies to the beleaguered Spanish Republicans, but the French material was too little in quantity and of inferior quality compared to the German and Italian equipment supplied to Franco's forces.⁷⁰

While events in Spain and Eastern Europe rocked French foreign policy, Cot launched a series of initiatives aimed at reforming the Air Force. He thought that the rank structure was too top-heavy, that the senior officers were too entrenched in the philosophies of the last war, and that promotion boards favored staff officers over their brethren who concentrated on operational and tactical expertise.⁷¹ Consequently, Cot forced many senior generals to retire while awarding commissions to nearly four hundred non-commissioned officers. He streamlined and reorganized the air staffs and combat commands to make them more efficient. Regardless of the necessity for such sweeping reforms, the abrupt way that Cot implemented them sparked resentment within the service. For the remainder of his tenure in office, Cot fought the Army and Navy's efforts to erode the autonomy of the air service on one hand, and his unpopularity with his own hostile officer corps on the other.⁷²

⁷⁰ On the Popular Front see Nicole Jordan, *The Popular Front and Central Europe: The Dilemmas of French Impotence (1918-1940)* (Cambridge: Cambridge University Press, 1992).

⁷¹ "...the barely qualified commanders, having earned their positions as a result of their participation in the battles of 1914-1918, most often in the *Armée de Terre*, dominated and blocked the advancement of more educated and specialized captains." D'Abzac-Epezy, *L'Armée de l'Air de Vichy*, 61.

⁷² Vivier, *La Politique Aéronautique Militaire de la France*, 381-387.

Guy La Chambre replaced Cot as Air Minister in 1938 and served in that capacity until the declaration of war. La Chambre recognized that Cot's reform initiatives had cast a pall over the entire service and he acted to restore the troop's confidence in the ministry. He chose General Joseph Vuillemin as his Chief of Staff. Vuillemin possessed impeccable operational credentials for the job. He was a bona fide war hero and world-famous explorer who had led a daring aerial expedition across the Sahara in the 1920s. The team of La Chambre and Vuillemin promised to focus the service on critically important issues—purchasing and flying new airplanes—rather than wasting airmen's time on political and doctrinal nonsense. La Chambre soothed the Army's ruffled feathers by granting General Gamelin, an old friend and Chief of Staff for National Defense, a measure of control over air forces deployed in the different operational theaters.⁷³ Vuillemin acknowledged that the Army's war plans placed a heavy burden on the air force for reconnaissance and pursuit aviation support. After 1938, visions of independent aerial operations gave way to a policy of cooperation and support for land forces. In any event, both aviation leaders were more concerned with rearming the air service with modern, competitive airframes.

With the completion of Plan I in 1937, airmen realized that the planes designed in the late 1920s and purchased in the mid-1930s would suffer horrible losses when confronting front-line equipment flown by Hitler's Luftwaffe. La Chambre pushed the Chamber of Deputies to authorize credits for a new modernization plan (Plan V). This

⁷³ The consequences of this decision may be detected in Gamelin's appraisal that "the role of aviation is apt to be exaggerated, and that after the early days of a war the wastage will be such that it will be more and more confined to acting as an accessory to the army." Anthony Admathwaite, *France and the Coming of the Second World War, 1936-1939* (London: Frank Cass, 1977), 162.

time the emphasis would be on purchasing specialized fighter, bombardment, and reconnaissance aircraft instead of opting for an all-purpose machine like the ill-fated BCR.

Fighter types made up the lion's share of the new program owing to the emphasis on metropolitan defense. French manufacturers still lagged behind the state-of-the-art design innovations and mass-assembly production techniques used by the other great air powers.⁷⁴ Industry representatives, promised delivery of a more modern air fleet no earlier than late-1941 or early 1942 at best—far too late to allow the *Armée de l'Air* to cope with the anticipated German onslaught. La Chambre desperately sought to obtain large numbers of American-built Curtiss pursuit planes, but by the late 1930s American public opinion severely limited the volume of airframes available and the pace of their delivery.⁷⁵

Adding to the mounting sense of urgency for the French Air Force, in September 1939 the agreement between the air leaders and Gamelin took effect. The immediate consequence was a complete reshuffling of the command structure of the air service. La Chambre and Vuillemin broke up Cot's large autonomous aerial regions and divided the air units piecemeal fashion among the various Army command theaters. Air commanders

⁷⁴ "Full of brilliant designers and skilled craftsmen, the aeronautical industry was a shambles, a congerie of small firms incapable of facing the world of modern productivity and unwilling to test its waters." Eugen Weber, *The Hollow Years: France in the 1930s* (New York: W. W. Norton and Company, 1994): 254.

⁷⁵ "Toward the end of September [1938] when an armed conflict in Europe seemed imminent, the American government informed France in writing that if war came the Neutrality Law would prevent it from delivering the planes which the French had ordered in May." William Shirer, *The Collapse of the Third Republic: An Inquiry into the Fall of France in 1940* (New York: Simon and Schuster, 1969): 356.

found themselves subordinate to Army commanders, often with no established lines of communication between air bases and army theater headquarters. To make matters worse, national mobilization brought on by the declaration of war hopelessly complicated the critically important coordination required to integrate the air and land efforts. As war descended upon the French air forces, the lack of command coordination resulted in predictably poor use of air resources. William Bullitt, United States Ambassador to France, described a conversation between General François d'Astier de la Vigerie and the Air Minister:

Almost every evening I had to lift up my telephone and take the initiative to inform the commander of the army and of the group of armies that I had, for the following day, a certain number of formations without missions, adding, "Have you any to give them?" Their reply was invariably the same: "We thank you very much but we do not have use for them." General d'Astier added that a mixed group of fighters and bombers attached to an army corps did nothing during ten to fifteen days.⁷⁶

Efforts to coordinate the allied war effort were no better off than the air-land dilemma. Pierre Cot wrote that "what is most lacking between France and its allies is the absence of technical and military accords, prior to war, between our Air Forces."⁷⁷ While Cot criticized the lack of coordination between the two allied nations, British leaders expressed concern over the material state of the French Air Force. The French responded that although they understood the importance of aerial rearmament they were doing all that was possible. In the last eighteen months before the declaration of war, the French repeatedly requested larger British air power commitments for the continent. The British

⁷⁶ Orville H. Bullitt, ed., *For the President, Personal and Secret: Correspondence Between Franklin D. Roosevelt and William C. Bullitt* (Boston: Houghton Mifflin Company, 1972): 423.

⁷⁷ Pierre Cot, *L'Armée de L'Air, 1936-1938* (Paris: Éditions Bernard Grasset, 1939): 69.

responded by agreeing to deploy light and medium bombardment units to northern France, but balked at the notion of weakening the Home Defense fighter force to help stop a German attack against their continental ally. In any event, even had the British deployed larger numbers of aircraft to help the French cause, there was virtually no coordination between the two air staffs.⁷⁸ The British bombers shared the fate of their French counterparts as commanders sent them into battle in penny-packets where the German fighters and anti-aircraft guns ground them up.⁷⁹

Since 1918, the air service had become accustomed to dealing with competing demands for its resources. When granted independence in 1933, the members of the *Armée de l'Air* had no institutional model with which to develop an independent role for air power. Pierre Cot set out to provide that model by ordering the air staff to write and publish a series of comprehensive doctrine manuals that spelled out the institutional position on every possible aviation mission. In doing so, Cot and the men who developed the air service's basic doctrine inadvertently reinforced the growing predilection toward reactive air power.

⁷⁸ Despite the assertion in the British official history that "the size and composition of air forces to be employed in France had been decided, the necessary measures for their operation had been agreed, and plans had been made for their prompt dispatch and accommodation," this was hardly the case. See Major L. F. Ellis, *The War in France and Flanders, 1939-1940* (London: Her Majesty's Stationery Office, 1953): 12. Thierry Vivier argues that the airmen of the two nations differed with regard to the most important objectives for the air forces. French officers argued for targeting German aerodromes to reduce the effectiveness of the Luftwaffe. British airmen advocated attacks on German factories, production centers, petroleum refineries, and other industrial targets. See Vivier, *La Politique Aéronautique Militaire de la France*, 557-558.

⁷⁹ For an account of the destruction of British light and medium bomber forces during the Battle of France see: Denis Richards, *The Hardest Victory: RAF Bomber Command in the Second World War*, (New York: W. W. Norton and Company, Inc., 1994).

CHAPTER 3

WRITING AND PUBLISHING REACTIVE AIR DOCTRINE

The considerable technical progress and the evolution of aviation doctrine among the world's powers has required us to envisage a new role for air power in the event of a conflict.¹

In the 1930s there was great controversy, as there is today, over how to develop air doctrine.² In the *Armée de l'Air*, competing demands at the strategic, operational, and tactical levels exerted pressures on how air power doctrine evolved in the critical years before World War II. Additionally, instability within the governments of the Third Republic filtered into the doctrine development process thus complicating the task of reaching a consensus on how best to employ air power. Despite the pressures brought on by the influences on the quest for a viable aviation doctrine, the leaders of the *Armée de*

¹ S.H.A.A.. Série 2B, Carton 109, Ministère de l'Air, "Principes Généraux d'Emploi et d'Organisation de l'Armée de l'Air: Rapport au Président de la République (Paris, 1 April 1933): 1.

² Sir Michael Howard wrote, "I am tempted indeed to declare dogmatically that whatever doctrine the Armed Forces are working on now, they have got it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives." See Michael Howard, "Military Science in an Age of Peace," *RUSI: Journal of the Royal United Services Institute for Defence Studies*, 119, March 1974: 7.

l'Air published statements that described how they intended to use air power to defend the nation against an aggressive enemy.

In 1933, after much debate, the French government reorganized the national defense structure and created the *Armée de l'Air* as an independent service.³ On one hand, granting airmen independence and autonomy from the Army and Navy appeared to be a logical and progressive move. Air power contributed in numerous ways to the successes of the Great War and with the apparent technological changes on the horizon in the early 1930s aviation seemed on a path that emphasized the need to capitalize on the unique capabilities afforded by military aviation. On the other hand, if France remained committed to ideals of collective security and disarmament, the creation of a large independent Air Force capable of striking targets deep in neighboring countries represented a contradiction in national strategy. Moreover, the emerging land warfare doctrine that relied upon fortified frontiers and massive firepower, the methodical battle, required a robust aviation component to provide observation, air superiority, close air support and battlefield interdiction.

Consequently, the law that created an independent air service within the French military establishment decreed "the Air Force should be capable of participating in aerial operations, in combined operations with the Army and the Navy, and in territorial air

³ For the details on the debate within the government and the press on the creation of the *Armée de l'Air* see: Marcellin Hodeir, "La Création du Ministère de l'Air Vue par la Presse Parisienne (Septembre, Octobre, Novembre 1928)," *Revue Historique des Armées* 4 (1988): 92-101. Thierry Vivier, "L'Armée de l'Air et la Révolution Technique des Années Trente (1933-1939)," *Revue Historique des Armées*, 1 (1990): 32-39. Pascal Vennesson, *Les Chevaliers de L'Air: Aviation et Conflits au XX^e Siècle* (Paris: Presses de Sciences Po, 1997): 127-143.

defense.”⁴ From the outset, the *Armée de l’Air* supported demands from its sister services while trying to develop formulas that expressed the best application of air power. The broad outline of the duties that members of the new service would perform reflected the tradition of cooperation and support for land and naval operations that existed since World War I. Thus, the air service appeared destined to drift among the various options for using aviation to pursue national interests. Airmen tried to remain faithful to visions of an independent role for the *Armée de l’Air* while simultaneously supporting legally mandated roles that centered on cooperating with the Army and the Navy. Existing doctrine failed to provide a framework within which the members of the new service could operate. Pierre Cot, the Minister for Air, aimed to establish adequate doctrine that airmen could use as a guide in the plethora of strategic, operational, and tactical situations in which they would find themselves in the 1930s.

TYPES OF MILITARY DOCTRINE

One of the first tasks that military professionals encounter when developing doctrine is to distinguish among the various types of doctrine they intend to create. The task is relatively simple if the existing doctrine conforms to the broad needs of the service; in this case, the task becomes one of revising or updating the existing doctrinal formulas. When creating doctrine for entirely new technological or strategic purposes,

⁴ S.H.A.A.. Série 2B, Carton 109, Ministère de l’Air, “Principes Généraux d’Emploi et d’Organisation de l’Armée de l’Air: Rapport au Président de la République (Paris, 1 April 1933): 3.

however, the task becomes much more difficult. New doctrines often threaten established values, beliefs, and practices thus causing conflict within the institution and with other military organizations. When this happens, the authors of the new doctrine must carefully define the type of doctrine their service needs. At least three types of doctrine serve as institutional guideposts for military professionals.⁵

Fundamental doctrine identifies the basic institutional values of a particular military service. It describes the characteristics that allow application of combat power in distinct media. Fundamental doctrine is more abstract, and thus more theoretical than other types of doctrine. In the interwar period, and some would agree even today, the theoretical basis for air power thought remained sketchy at best.⁶ For the French Air Force, the writings of Giulio Douhet may have represented the most concise source of

⁵ For a description of the types of doctrine and how services use doctrine see: Dennis Drew and Donald M. Snow, *Making Strategy: An Introduction to National Security Processes and Problems* (Maxwell AFB, AL: Air University Press, 1988): 163-174. On the relevance of doctrine and the doctrine development process see: Gary Waters, ed. *RAAF Air Power Doctrine: A Collection of Contemporary Essays* (Canberra: Strategic and Defence Studies Centre, 1990): 7-12.

⁶ David MacIssac wrote "there has been no lack of theorists, but they have had only limited influence in a field where the effects of technology and the deeds of practitioners have from the beginning played greater roles than have ideas." See David MacIssac, "Voices From the Central Blue: The Air Power Theorists," in Peter Paret, ed. *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986): 624. More recently, Phillip Meilinger observed, "Airmen from any country have seldom been accused of being thinkers, and precious few have taken up the pen to write down their thoughts on how airpower should be employed in war. Added to this is the relatively short time airpower has existed: all in the past century. As a result, there have been a limited number of books, articles, and manuals written to date that have dealt with the theory and doctrine of airpower." See Phillip S. Meilinger, "The Historiography of Airpower: Theory and Doctrine," *The Journal of Military History* 64 (April 2000): 467.

fundamental doctrine.⁷ Douhet's conception advocated the creation of air forces organized to strike enemy air bases and cities in order to gain command of the air and to establish the conditions that led to the destruction of the will of the enemy civilian population. This formula clashed somewhat with the liberal disarmament ideals that characterized much of the Radical Socialist agenda to which Cot and his colleagues adhered. The Italian's visions of offensive striking power remained an attractive departure point, however, from which French airmen could justify service independence and autonomy.⁸

Organizational doctrine describes how services interact with other services on one hand, and how services organize internally to conduct combat and other operations on the other. With the advent of modern, technologically sophisticated armies, navies, and air forces came the need for a common understanding of how to unify the separate efforts in order to achieve common strategic or operational objectives. The interservice conflicts that arose when developing air doctrine in the interwar period stemmed, in part, from air

⁷ Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (Washington, D.C.: Office of Air Force History, 1983).

⁸ Thierry Vivier argues that the *Armée de l'Air* adopted Douhet's ideas about air power. He based that assessment in part on the decision to procure the all-purpose Bombardment-Combat-Reconnaissance (BCR) airplane. Vivier makes a convincing argument that the BCR represented an attempt to field Douhet's "battleplane." See Thierry Vivier, *La Politique Aéronautique Militaire de la France: Janvier 1933-Septembre 1939* (Paris: Éditions L'Harmattan, 1997): 59-64. Pascal Vennesson argues that the French Air Force thoroughly rejected Douhet's philosophy of aerial bombardment. He wrote "No doctrine, and in any case no doctrine of long-range strategic bombardment, was imposed as an underlying ideology in the institutionalization of the Air Force." See Vennesson, *Les Chevaliers de l'Air*, 167-172. A contemporary critique of Douhet's ideas and their applicability to French strategic concerns is Colonel P. Vauthier, *La Doctrine de Guerre du Général Douhet* (Paris: Éditions Berger-Levrault, 1935).

power's ability to range beyond the reach of land and naval forces. Airmen conceived of war at the strategic level, as in the case of British and American strategic bombing doctrines, or at the operational level of war. These new visions of military effectiveness questioned the utility of established methods of warfare. Thus, the most difficult obstacle French airmen confronted when developing organizational doctrine lay in identifying areas of common ground, assigning service priorities, and selecting command arrangements that allowed the services to integrate their capabilities without compromising fundamental service doctrines. The leaders of the *Armée de l'Air* struggled with representatives from the land and sea services throughout the 1930s over the most effective organizational air doctrine for national defense. Conflicts with the other services contributed significantly to the reactive doctrine that came to characterize the French air service approach to aerial warfare because they forced the airmen to conform to organizational formulas that threatened or compromised the tenets of fundamental air doctrine.

Finally, tactical doctrine defines how military forces intend to employ specific weapon systems in battles and engagements. In many instances, tactical doctrine is the simplest form of doctrine to construct. Yet by focusing on the specifics of tactics and maneuver, military professionals may become complacent, too technically minded, and may lose step with the strategic and operational context that drives the war effort.⁹ The conflicts that arose between the *Armée de l'Air* and the other services over fundamental

⁹ Carl Builder argued that this is exactly what happened in the United States Air Force after World War II, and especially after Vietnam. See Carl H. Builder, *The Icarus Syndrome* (New Brunswick, NJ: Transaction Publisher, 1996).

and organizational doctrines caused French airmen to focus on producing tactical doctrine to the exclusion of nearly every other doctrinal task. The leaders of the *Armée de l'Air* found that tactical doctrine remained one of the few areas that they could explore in relative freedom from sister service interference. The product was an air service that came to rely heavily on technical and tactical expertise and thus leaving airmen poised to react to strategic and operational circumstances rather than preparing them to seize and to exploit the initiative using air power.

Relationships between formal and informal doctrines can also characterize military doctrines. The degree that formal, written doctrines coincide with operational and tactical procedures describes the sophistication and maturity that exists between formal and informal institutional values, practices, and norms. At the beginning of the doctrine development process there may be a close correlation between formal and informal doctrines. This applied, to a great extent, to air power doctrine during and immediately after World War I. Combat experience, technological limitations, and the absence of a sound theory resulted in a widely accepted informal doctrine that most airmen and soldiers embraced. In other words, formal and informal doctrine corresponded to the tactical doctrine that had worked under fire. After the war, however, air theorists began to reflect upon the experiences of the war; the difference between formal and informal doctrines became greater as the body of air power theory diverged from the World War I experience.

Several events may prompt changes that reduce the discrepancies between formal and informal doctrine. The first event that can motivate military professionals to bring formal and informal doctrines closer together occurs when the body of military theory

expands. Often, but not always, this may result from direct experience in combat.¹⁰ For aviation, the Great War represented the departure point, the catalyst, for military applications of air power. Second, technological change may widen the gaps between formal and informal doctrines; thus, an advance in technology may provide incentives for doctrinal change. This was the case in the late 1920s and early 1930s for nearly every major air power.¹¹ New airframe designs, better engines, increased payloads, and longer range for aircraft heralded a technological shift that expanded the possibilities for military aviation beyond the boundaries established during the Great War. Changes in strategic circumstances may also dramatically affect informal and formal doctrines. In the interwar period, the failure of collective security and disarmament, the worldwide economic depression, and the resurgence of a belligerent Germany kept French diplomats and military strategists off balance. As the strategic landscape changed, French airmen repeatedly examined the relevance and adequacy of their doctrines. The result caused the members of the air service to lose confidence in their ability to close the gaps between formal and informal doctrines. Finally, the doctrine development process comes full circle as military professionals try their doctrines in combat. There is no more painful experience in war for a military organization than the discovery that the deeply held values and beliefs about how best to employ a particular specialty are woefully lacking.

¹⁰ The obvious case of a doctrine that evolved without direct combat experience is the development of nuclear deterrence theory in the United States. See Lawrence Freedman, *The Evolution of Nuclear Strategy*, 2d Ed. (New York: St. Martin's Press, 1989).

¹¹ For a discussion of how the European powers adapted to theory and doctrine to the new weapon in the interwar years see: James S. Corum, "Airpower Thought in Continental Europe between the Wars," in Phillip S. Meilinger, ed., *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, AL: Air University Press, 1997): 151-181.

Some degree of irrelevance is inevitable, but if the institutions fail to foster imagination, innovation, and initiative the outcome may prove disastrous and irreversible.

THE *ARMÉE DE L'AIR* AND FUNDAMENTAL AIR DOCTRINE

In 1933, Pierre Cot and the leaders of the *Armée de l'Air* set out to resolve two related processes. The first was to promote a flexible and complete doctrine that addressed fundamental, organizational, and tactical needs within the new service. The second was to ensure that the doctrine remained relevant by narrowing the gaps between formal and informal doctrines. The first process addressed concerns held by airmen and by members of the other services; the second process addressed concerns within the air service. The foundations of air doctrine would allow airmen "to realize the most judicious employment of the materials in service, to conceive and to prepare the new doctrine based on the materials that modern technology will permit putting into service in the years to come."¹² The vision that Cot attempted to communicate to the airmen was one of establishing the continuing utility of the independent air service within the national defense establishment.

One of the most important questions Cot and his staff faced was what type of air service to create. One thing was certain; the existing structures would prove decidedly inadequate for the wars of the future because they remained tied to a model of land

¹² S.H.A.A., Série 2B, Carton 109, Ministère de l'Air, Cabinet du Ministre et État-Major, Général de l'Armée de l'Air, "Circulaire Confidentielle Pour les Cadres de l'Armée de l'Air," 22 October, 1933: 1.

warfare characterized by stationary fronts. Cot anticipated a German surprise attack aimed at delivering a quick knockout blow to French military and industrial power. He argued that German military, economic, and material conditions favored a short war rather than a long conflict. "The short war assumes the offensive—the continuous offensive. And the offensive assumes a considerable superiority of means."¹³ Cot argued that air power remained the most flexible and effective instrument available to draw the Germans into a long war, if war occurred, that best served French interests. The *Armée de l'Air* required a complete revision of French air power doctrine and structures was necessary to prepare the new service intellectually and structurally to counter the German threat. Cot wrote, "Until 1933 we had military aviation, but not an Air Force. Our air power was entirely at the disposition of the Army and the Navy, its material and its doctrine being oriented only toward cooperation missions."¹⁴ This emphasis away from air power as a supporting element for the other services defined the broad outlines of the fundamental doctrine that Cot urged upon the *Armée de l'Air*.

In a 1933 report to the President, Cot emphasized the flexibility he hoped to instill in the new air arm. "Instead of air forces that are strictly specialized with respect to particular missions, it is necessary to have an air force capable of taking part, to defend the nation, either in purely aerial operations, or in terrestrial or naval operations."¹⁵ In the new Air Ministry, Cot would assume an active role in the doctrine development process.

¹³ Pierre Cot, *L'Armée de l'Air, 1936-1938* (Paris: Éditions Bernard Grasset, 1939): 37.

¹⁴ Ibid., 131.

¹⁵ S.H.A.A., Série 2B, Carton 109, Ministère de l'Air, "Principes Généraux d'Emploi et d'Organisation de l'Armée de l'Air: Rapport au Président de la République," 1 April, 1933: 1.

In his view, "the personal role of the Minister was to choose and to define doctrine, just as to choose and to determine the operational plans, as a function of the Minister's doctrine, was the role of the Chief of Staff."¹⁶

Cot aimed to create a service that could react to any mission the nation required of it. The new air minister was not naïve, however. He realized that events in Germany did not bode well for the French Republic. The Germans would attempt to overcome the restrictions that the Versailles Treaty imposed upon their military. Therefore, according to Cot, airmen could ill afford "to believe that a new war will resemble that which we have known. To fail to realize that the new possibilities of aerial technology offers new tactical possibilities and, consequently exposes our country to new dangers, in a word, lacks imagination."¹⁷ Examined in the context of new operational possibilities and looming strategic dangers the aerial weapon presented a sword that could cut both ways.

The *Armée de l'Air* represented a new, technologically sophisticated force that promised decisive results in war, but, regardless of air power's ability to achieve decisive results, it would certainly prove essential to any future European conflict. Imagination and innovation would become the defining institutional characteristics that Cot sought to foster in his doctrinal and structural revisions for the new service. In order to achieve Cot's objectives, the service would have to abandon conventional thinking about employing aviation that emphasized the material and technological limits of air power. One author speculated, "...modern air power can possess today the tactical and strategic

¹⁶ Cot, *L'Armée de l'Air*, 123.

¹⁷ S.H.A.A., Série 2B, Carton 109, Ministère de l'Air, Cabinet du Ministre et État-Major, Général de l'Armée de l'Air, "Circulaire Confidentielle Pour les Cadres de l'Armée de l'Air," 22 October, 1933: 2.

power to assume a preponderant role in a future conflict. Surprise, maneuver, concentration of means, direct and constant intervention against the enemy's sources of supply—with all the promise that they offer—are they not entirely possible for the Air Force?"¹⁸ The imagination and vision that Cot sought to instill among the airmen rested upon a free exchange of air power ideas. His initial directive to the officers who would write and employ the air doctrine reflected this philosophy. "These ideas," he wrote, "do not express a rigid, inflexible aerial doctrine. They should serve as a theme for reflection. They do not reject critiques. Much to the contrary, they are intended to provoke."¹⁹ In the early days of service independence, the *Armée de l'Air* appeared poised, intellectually, to formulate and to embrace new ideas about fighting the nation's wars.²⁰

One of the first elements the leaders of the new service confronted was the increasing instability that characterized the European strategic environment in the 1930s. Cot's assessment of German plans for a rapid, decisive war meant that the addition of air power increased the civilian population's concerns about enemy aerial attacks. Aerial

¹⁸ S.H.A.A., Série 2B, Carton 109, "La Doctrine d'Emploi de l'Armée de l'Air," n.a., October 1933: 6. Although this document does not bear Cot's signature, it conforms to his style and his philosophies about air power. Moreover, the policy issues that the author discussed reflect those of a highly placed individual in French politics.

¹⁹ S.H.A.A., Série 2B, Carton 109, Ministère de l'Air, Cabinet du Ministre et État-Major, Général de l'Armée de l'Air, "Circulaire Confidentielle Pour les Cadres de l'Armée de l'Air," 22 October, 1933: 2.

²⁰ The desire for innovation and intellectual stimulation expressed by Cot in the early days of air force independence contrasts with the picture painted of intellectual stagnation in the French military during the interwar years painted by Williamson Murray. See Williamson Murray, "Armored Warfare: The British, French, and German Experiences," in Williamson Murray and Allan R. Millett, eds., *Military Innovation in the Interwar Period* (Cambridge: Cambridge University Press, 1996): 29-34.

warfare promised to bring war to the doorsteps of every citizen.²¹ According to one staff officer, "the feeling of security procured by our population by the existence of a solid army profiting from an organization of fortified frontiers is found to be shaken: each family feels threatened, every town feels targeted. From a conception of war more or less localized to the area of the armies, is substituted one of a total war exercising its ravages on the entire nation."²² The possibility that war could rapidly spread to encompass the nation, its infrastructure, and its social fabric helped to frame the requirements for new ideas about how to wage war in the air.

French airmen used the term *lutte aérienne* (aerial warfare) to describe the central concept of how to counter an enemy with the potential to hold every town at risk. This term allowed the airmen to consolidate all aspects of air power into one concept because it was flexible enough to encompass offensive, defensive, and cooperation missions. "Thus the *Armée de l'Air* should orient itself to adapt to methods that correspond to new aspects of *lutte aérienne*. These new methods emphasize the predominance of collective combat over the individual combat that characterized the last war to a great degree."²³ Yet, it also revealed the revolutionary potential of the air weapon to win wars. The key to waging successful *lutte aérienne* lay in massing air forces to accomplish common objectives.

²¹ See François Pernot, "L'armée de l'air face aux crises des années trente: une étude moral," *Revue historique des armées*, 4 (1990): 116-127. Eugen Weber, *The Hollow Years: France in the 1930s* (New York: W. W. Norton and Company, 1994).

²² S.H.A.A., Série 2B, Carton 109, "La Doctrine d'Emploi de l'Armée de l'Air," n.a., Oct 1933: 1-2.

²³ S.H.A.A., Série 2B, Carton 109, "Ministère de l'Air, Cabinet du Ministre et État-Major, Général de l'Armée de l'Air, "Circulaire Confidentielle Pour les Cadres de l'Armée de l'Air," 22 October, 1933: 9-10.

The complexity of *lutte aérienne* required a new understanding of warfare.

General Vuillemin, a future Air Force Chief of Staff, observed

The historical experience of air war does not constitute a collection of 'offensive or defensive' battles separated by time, by orders, or by delays. It presents the character of a single 'fight' which prolongs itself during the entire duration of the war, and it pertains to the battle of attrition with alternatives of success and failure. In this battle, offensive and defensive operations are found constantly juxtaposed, sometimes even combined.²⁴

Vuillemin argued that to couch perceptions of *lutte aérienne* in terms of land or naval warfare concealed the complexity and the decisive potential that air power brought to the modern war effort.

The legal requirement for the Air Force to support Army and Navy operations forced the airmen to forge a conceptual link between the emerging air doctrines and those of the traditional services. Despite the airmen's visions of decisive air campaigns, the characteristics of *lutte aérienne* that made it politically acceptable within the Third Republic centered on the flexibility that allowed the *Armée de l'Air* to accommodate and support contemporary conceptions of land and naval warfare. For cooperation with the Army, in particular, airmen created a doctrine that emphasized providing security for the Army during mobilization and defensive operations. Pierre Cot observed, "in the current technological conditions, the belligerents will endeavor, in the first place, to paralyze their adversaries by bombing their military centers, by hindering troop and material transports, by blocking industrial mobilization, and by throwing civil populations into

²⁴ S.H.A.A., 2B, Carton 109, Général de Division Vuillemin, Membre du Conseil Supérieure de l'Air, Commandant le 1er Corps Aérien, à M. le Ministère de l'Air, "Instruction sur l'emploi tactique des Grandes Unités Aériennes," 29 July, 1937: 3.

disarray.”²⁵ Thus, the leaders of the *Armée de l’Air* shouldered the twin burdens of protecting the fragile civilian population and the Army as it concentrated its combat effectives and moved them into contact with the advancing enemy.

The prospect of rear areas thrown into disarray suggested that a clash of air forces, rather than a clash of armies, would characterize the initial battles of a future war. In such a clash, the Air Force assumed responsibility for offensive and defensive missions as integral parts of *lutte aérienne*. The key to winning in aerial warfare lay in carrying the fight to the enemy. Air forces could target the entire enemy society in order to “destroy the enemy air force by bombing its bases, hangars, and air fields, and fuel depots; disrupt mobilization and concentration of the enemy armies by bombing principal communication nodes, barracks, and mobilization centers; and target national morale by bombing large towns.”²⁶ In the early days of Air Force independence, the Army demanded a fixed number of airplanes for air superiority and reconnaissance support. Based upon Army estimates, the Air Force agreed to dedicate 200 reconnaissance and pursuit planes to service Army needs. But the possibility of an aerial war occurring without a corresponding ground battle resulted in a demand by the air service that “the Commander of the land forces will put, each time that he is able, a portion of this allotment at the disposal of the Air Department for use in the *lutte aérienne*.”²⁷ If the predominant effort dictated that air forces carry the weight of the war effort, land units, in principle, would support the *Armée de l’Air* as it waged the aerial battle.

²⁵ Ibid., 3.

²⁶ Ibid., 3.

²⁷ S.H.A.A., Série 2B, Carton 109, “Note au sujet de la lutte aérienne,” n.a., Oct 1933.: 6-7.

The conceptual structure of *lutte aérienne* that accommodated defensive applications for air power represented a significant departure from prevailing interwar air power theories that focused on the offensive character of aerial warfare. The French airmen attempted to include defensive applications for aviation in their expressions of fundamental doctrine in order to conform to the basic outlines of French national military strategy. The gravity of the German threat, however, meant that no single service could assume the responsibility of national defense. Therefore, as one airman concluded, "modern air power could, and should, intervene to the benefit of land and naval operations in a larger way than that of cooperation."²⁸ The logical solution to resolving the question of integrating defensive and offensive missions into a unified *lutte aérienne* was to turn offensive aerial strategies to defensive purposes. "In the aerial domain, as in the terrestrial domain, only the offensive can yield decisive results. This is why only bombardment aviation is capable of attacking the enemy's vital areas; to carry the war in all circumstances over his territory remains incontestably one of the essential factors of the power of the air arm."²⁹ Therefore, a single component of the air service could satisfy requirements of national defense by simultaneously waging an offensive and a defensive *lutte aérienne* that targeted the entire enemy society. While the airmen grasped the complexity contained in the structure of *lutte aérienne*, their Army brethren acknowledged only the defensive aspects aerial warfare.

Thus, the fundamental precepts of French air doctrine contained a controversy

²⁸ S.H.A.A., Série 2B, Carton 109, "La Doctrine d'Emploi de l'Armée de l'Air," n.a., Oct 1933.: 8.

²⁹ Ibid., 16.

over whether offensive missions designed to carry the war to the enemy, or defensive missions that relegated the Air Force to a role as a protective shield for the Army, defined the character of the new service. The debates within the service and with members of the other services that continued throughout the 1930s failed to produce a resolution to this central issue of fundamental doctrine. Consequently, the members of the *Armée de l'Air* remained in a nether world of ill-defined priorities about their service's role in a future war.

French fundamental air power doctrine in the 1930s developed, to a large degree, because of technological developments as much as from theoretical developments. For the French Air Force, technology presented a dilemma upon which efforts to produce doctrine threatened to founder. On one hand, the limited experience with existing aircraft designs suggested that air power had little to offer in independent aerial warfare. Additionally, the pressures of disarmament policies, economic stress, and national reluctance to appear provocative served as a brake on technological and doctrinal development. On the other hand, as French leaders became convinced that another European war was inevitable, aviation technology promised to offer a relatively inexpensive solution to the national defense conundrum. In other words, the technology-dctrine nexus contributed to the uncertain and halting development of French reactive air power thought in the 1930s.

Pierre Cot and General Victor Dénain, his Chief of Staff and later his successor as Air Minister, attempted to solve the technology-dctrine dilemma by directing the Air Force to procure multi-place airplanes designed to perform multiple missions.

[T]he multi-place airplane gives us the possibility to satisfy these two needs [offense and defense] but not necessarily simultaneously. By a modern application of the old principle of economy of force, this machine allows us in effect to fulfill, according to the circumstances, the missions of bombardment or cooperation and to solve in a satisfactory manner the much talked about problem of reconnaissance aviation.³⁰

Cot arrived at this assessment by weighing several perceptions about the strategic environment, the capabilities of French aviation industries, the needs of the Army and Navy, and the needs of the Air Force.

The view of an enemy dedicated to waging quick, offensive, total war produced the fundamental doctrinal precepts of *lutte aérienne*. Cot found French aviation industries mired, however, in inefficient, outdated production methods. If the Air Force was to rearm quickly, either the industrial capability would have to change, or the service would have to compromise its desires for large orders of modern aircraft types. He wrote, "It is necessary first to consider not only the position taken by France in international negotiations on limiting aerial armaments, but also of the budgetary repercussions which are involved with a radical modernization of our air units... The renovation should then be conducted with a new spirit of economy, substituting quality for quantity."³¹ Additionally, the Army and the Navy closely monitored the Air Force to ensure that Cot and the airmen did not jeopardize air support capabilities for land and sea missions. Finally, the airmen developed competing views on the proper technological path to pursue. Airmen adopted positions that emphasized air power as both an independent and as a supporting force, subordinate to the Army, in the national defense

³⁰ S.H.A.A., Série 2B, Carton 109, "La Doctrine d'Emploi de l'Armée de l'Air," n.a., Oct 1933: 17.

³¹ Ibid., 13.

scheme. Cot used his authority as Air Minister to resolve these competing demands for air power technology.³²

The Air Minister elected to procure the multi-role Bombardment-Combat-Reconnaissance (B.C.R.) plane as a compromise solution that addressed the external competing demands upon the Air Force while preserving the service's ability to perform in independent *lutte aérienne*. Nevertheless, the B.C.R. drove the *Armée de l'Air* into a doctrinal and technological box canyon. From a technological standpoint, the B.C.R. established severe constraints on airframe and engine development philosophies for all aircraft types in France for most of the decade that preceded the Second World War. The multi-role airplane was too slow and had insufficient payload capacity to perform effectively as a bomber, was too heavy and thus too slow to perform effectively as a fighter, was too lightly armed to perform effectively as a close support platform, and was too vulnerable to perform effectively as a reconnaissance platform. In other words, the airplane designed to perform many roles performed none well.

From a doctrinal perspective, the B.C.R. established technological limits on nearly every aspect of aviation doctrine. The multi-place, multi-purpose B.C.R. drove the French to rely on organizational and tactical doctrines predicated upon formations for protection rather than upon high-performance fighter escorts. The key protective advantage gained in formation flight applied primarily to the bombardment mission.

³² For a thorough development of the problems with French aeronautical industries see: Emmanuel Chadeau, *L'industrie aéronautique en France, 1900-1950: De Blériot à Dassault* (Paris: Fayard, 1987). Vivier, *La Politique Aéronautique Militaire de la France*, 199-215. Herrick Chapman, *State Capitalism and Working-Class Radicalism in the French Aircraft Industry* (Berkeley: University of California Press, 1991).

According to French doctrine, "one crew or one formation can only hope to accomplish their mission if they assure themselves freedom of maneuver with minimum acceptable security."³³ Thus, the formation discipline emphasized in the doctrine took precedence over other operational and tactical schemes. While this formula was adequate for long-range bombardment strikes, it left a hole in the operational and tactical philosophy for pursuit, close support, and reconnaissance missions.

THE *ARMÉE DE L'AIR* AND ORGANIZATIONAL DOCTRINE

In many ways, the reactive air doctrine with which the *Armée de l'Air* fought in 1940 was a product of the service's failure to create an effective organizational doctrine. This failure obtained, in part, from a weak institutional bargaining position *vis à vis* the Army and the Navy. This does not fully explain, however, why the airmen were not more forceful in their defense of the independent roles for air power. Some airmen, like Generals Paul Armengaud and Joseph Vuillemin, argued that defensive and cooperative missions and the accompanying subordinate role for air power represented the most sensible ways to employ aviation. The chorus of competing voices from the Army and the Navy in the formative years of the French independent air service only made the task of creating organizational doctrine more difficult.

The first hurdle that the leaders of the *Armée de l'Air* had to cross in the effort to build organizational doctrine was the issue of who commanded French air units. When

³³ S.H.A.A., Série 2B Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 29.

viewed in light of the *lutte aérienne*, this issue seemed simple—airmen should maintain operational control over the complex defensive-offensive aerial battle. Things were never that easy for the airmen, however. The law that created the independent air service erected an obstacle that complicated command relations between airmen and their land and sea counterparts. The language built into Article I of the law required the Air Force to participate in cooperative missions with the Army and the Navy.³⁴ This provided the justification for land and sea officers to keep their younger sister service in a subordinate role.

Air leaders assigned dedicated aviation units to the Army commands in an attempt to use an organizational device to circumvent the legal mandate to cooperate with the Army. This idea had its roots in the early days of service independence when Pierre Cot tried to make a clean break with the Army. Cot reasoned that a properly organized, equipped, and trained Air Force would serve the needs of Army commanders more effectively by waging *lutte aérienne* in independent air operations. Therefore, in order to appease the Army's demands for air resources, Cot placed short-range, light aviation (*aviation légère de défense*) at the disposal of regional Army commanders as a

³⁴ The organizational law of 2 July 1934 included the stipulations that "In time of war the division of the air units mobilized between the reserve air forces and the air forces placed at the disposal of the Army and the Navy is determined by the government on the basis of operations...The air forces placed at the disposal of the Army are commanded by a general officer of the Air Force placed under the authority of the general officer of the Army commanding the theater of land operations in question. The air forces placed at the disposal of the Navy are commanded by a general officer of the Air Force placed under the authority of the vice-admiral commanding the theater of naval operations in question." Quoted in Charles Christienne and Pierre Lissarague, *A History of French Military Aviation* trans. Francis Kianka (Washington, D.C.: Smithsonian Institution Press, 1986): 253-255.

component of the air reserves. These reserve units would support the Army by performing local air superiority, reconnaissance, and artillery spotting missions. The Air Minister wrote, "By thus constituting, organizing, and training these squadrons we could eventually make parts of our Air Force available for other missions."³⁵ From Cot's perspective, this solution eliminated missions that threatened to whittle away at service autonomy. This formula contained the added benefit of transferring a fleet of obsolete airplanes out of the frontline inventory into the reserve units destined to accomplish the cooperation missions.³⁶

The generals and admirals recognized a swindle when they saw one. Army leaders, in particular, used the precedent of having detached air units placed under the authority of land commanders to ensure that land cooperation units received priority in air doctrine and plans. By the time that the Air Ministry published the *Règlement de Manoeuvre de l'Aviation* in 1937, the leaders of the air service recognized that the Army had hoisted them on their own petard. The reserves assigned to cooperate with army regional commands became "Regional Air Groups of the Army" and the air commanders for those groups found themselves subordinate to Army commanders (*Grandes Unités Terrestres*).³⁷ Army commanders tasked aviators for all missions. Senior aviators

³⁵ S.H.A.A., Série 2B Carton 109, Ministère de l'Air, Cabinet du Ministre et État-Major, Général de l'Armée de l'Air, "Circulaire Confidentielle Pour les Cadres de l'Armée de l'Air," 22 October, 1933: 4.

³⁶ The airplanes Cot relegated to the reserves for the Army's use included the early 1920s-vintage LeO XX, and the Farman biplane designs that were outclassed when the new generation of all-metal monoplanes emerged in the mid-1930s. See Faris Kirkland, Patrick Facon, Thierry Vivier.

³⁷ SHAA, Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (4^e Partie) (Paris: Imprimerie Natinoale, 1937): 21.

performed roles analogous to those performed by airmen in World War I. Their tasks included executing missions passed down from Army headquarters, advising Army generals on the best use of airpower, training air service personnel, and maintaining the equipment assigned to the aviation units. The *Règlement* specified that the aviation commander “advises the commanding general of the Army of the difficulties which could arise from a technical point of view, he proposes, or takes on his own initiative, all useful measures to repair them.”³⁸ Rather than eliminating an unwanted mission as Cot intended, the establishment of the Regional Air Groups of the Army entrenched the cooperation mission deeper into organizational air doctrine thus, guaranteeing that reacting to tactical situations in the proximity of the Army Corps remained a high priority for the *Armée de l’Air*. But the greatest, and most detrimental, result that stemmed from Cot’s attempt to foist an unwanted mission upon the Army was to reinforce a subordinate role for airmen in the eyes of Army leaders.

The cooperation mission for the *aviation légère de défense* units gradually migrated from the reserves to the frontline units. In doing so, the air units that may have performed long-range reconnaissance or bombardment missions found themselves placed under the authority of Army commanders. The airmen reconciled themselves to this arrangement by remaining focused on the *lutte aérienne*, particularly on the defensive aspects of their fundamental doctrine. In peacetime, or in the early days of a conflict, the Air Force Commander-in-Chief coordinated aerial actions with the Army Commander-in-Chief. In principle, the Army commanders tasked the aviation units at their disposal as they saw fit while the Air Force fought “against the aerial expeditions of the enemy to

³⁸ Ibid., 24.

halt their strikes as close to the lines as possible and to attack them along their routes with maximum effort.”³⁹ In reality, at the instigation of hostilities the Air Force reverted to an on-call arrangement that subordinated the formerly independent air service to regional land commanders. As the Air Staff described this arrangement, “the elements thus sent as reinforcements will pass to the orders of the Commander of the air forces of the affected land echelon.”⁴⁰ The Air Staff failed to anticipate, however, the effects on air service capabilities that resulted from the Army view that the “Commander of the air forces,” remained a mere technical adviser to the Army commander rather than an equal partner in the process of formulating operational plans.

This uncertain and unwelcome state of affairs affected pursuit units as well as heavy aviation, or bombardment forces. If an enemy attack threatened to overwhelm Army units in a particular region, the Air Force agreed to divert all available heavy aviation assets to stabilize the situation. This requirement resulted in an ill-defined set of priorities for the bombardment units. Generally, the first priority for the bombers remained the destruction of the enemy air force, but because of the necessity to protect the Army, the heavy bombardment aviation units had to remain ready to abandon their missions “to support terrestrial operations by attacking troops and communications of the enemy with all or part of their forces.”⁴¹ To heighten the uncertainty in this situation, the air units would find a confusing command arrangement as their primary mission changed.

³⁹ S.H.A.A., Série 2B, Carton 109, Ministère de l’Air, 3^e Section, “Instruction Générale sur l’emploi des Forces Aériennes Mises à la Disposition de l’Armée de Terre, et la D.C.A. des Armées au Debut des Hostilités,” 7 July, 1936: 3-4.

⁴⁰ Ibid., 6.

⁴¹ Ibid., 7.

"This action will occur either under the direct orders of the Air Force Commander-in-Chief, or by temporarily placing a certain number of units at the immediate disposal of the land commander."⁴² No other organization within the French military establishment operated with such a confusing organizational doctrine.

The relationship between the *Armée de l'Air* and the Navy was even more difficult than the convoluted relationship that existed between the air and land services. To the credit of the airmen, they made a genuine attempt to comply with the intent of the 1933 law that directed the air service to develop a cooperative relationship with the sea service. The 1937 *Règlement de Manoeuvre de l'Aviation* specified, "if maritime cooperation formations of the Air Force should be trained in destruction missions of interest to maritime operations, it is important that all formations or all aircrews are allowed to participate in the search, collection, and diffusion of maritime intelligence."⁴³ This organizational task occupied more coordination and compromise than the Navy or the Air Force could achieve. The Air Force resisted establishing dedicated naval cooperation forces such as the *aviation légère de défense* that operated in Army support missions. The airmen finally stated emphatically "There are no aviation formations normally granted to the *Grandes Unités navales* in the Air Force."⁴⁴ For its part, the Navy jealously guarded its authority over missions that pertained to coastal defense and power projection from the sea.

⁴² Ibid.

⁴³ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 17.

⁴⁴ Ibid., 14.

Air Force leaders chafed under the Navy's refusal to grant them even limited authority for air missions that occurred near maritime operating zones. For its part, the Navy envisioned air units operating under the direct command of maritime prefects. Missions could arise, in the opinion of the Navy Ministry that required air units to "coordinate with naval operations—such as the attack of enemy bases or coastal areas."⁴⁵ However, because such missions remained within the general purview of naval operations, the air units assigned to such operations "should be placed under the orders of the naval commander."⁴⁶ With cold logic, the Navy Ministry concluded that the proper role for senior aviators in maritime power projection was to "assure command of the formations, to act as technical advisor to the Maritime Forces commander, and to assure the liaison with the Commander-in-Chief of the Air Force. In other circumstances, the presence of an air commander placed next to a maritime commander does not seem necessary."⁴⁷ The Navy formula relegated senior aviators to roles as mere technical advisers and messengers with no influence on either campaign strategy or operational execution. This prescription mirrored the treatment airmen received at the hands of the Army when they performed cooperation missions.

When the issue of coastal defense arose, the Navy's resistance to alter its existing command structures stiffened. The Navy organized and controlled the aerial defense of sensitive ports and coastal areas through an arrangement whereby the Army provided

⁴⁵ S.H.A.A., Série 2B, Carton 109, Ministère de la Marine, État-Major Général, Section d'Études Générales, 3^{ème} Bureau, "Observations au Sujet de l'Instruction du 31 Mars 1937 sur l'Emploi Tactique des Grandes Unités Aériennes," 7 August, 1937: 3.

⁴⁶ Ibid.

⁴⁷ Ibid.

anti-aircraft artillery to the Navy, but the Navy exercised command over the defensive units. The Navy Ministry perceived the addition of pursuit aircraft to the coastal defense mission in much the same way that it did the anti-aircraft artillery provided by the Army. The Navy Ministry concluded, "It will be the same for pursuit assigned to the authorities charged with defending sensitive points; the higher authority (in practice, the maritime prefect) can, at any time, act to coordinate or to concentrate the action of the air forces participating in the pursuit."⁴⁸ In other words, the Navy could not conceive any rationale for an enhanced role for senior *Armée de l'Air* commanders in either offensive or defensive maritime operations. The effect of sea service's refusal to alter existing command and control arrangements coupled with the Army's persistent clamoring for more air resources to shield and support its mobilization and defensive efforts helped to ensure a flawed and reactive organizational doctrine for the Air Force.

With their efforts to construct an effective organizational doctrine that defined how the Air Force would operate in joint operations with the Army and Navy mired in disagreements over the division of command authority, the airmen turned to develop organizational issues within the air service. Here, unsurprisingly, they met with little more success than they had in other doctrine development efforts. The air service attempts to articulate how the *Armée de l'Air* could offer a unique contribution to the nation's strategic problems seemed destined to fail because the airmen failed to resolve conflicts regarding an independent *lutte aérienne* and the demands by the Army and the Navy for the air service resources to support land and sea operations.

⁴⁸ Ibid., 4.

The vehicle that the Air Force used to codify its doctrine was the four-part *Règlement de Manoeuvre de l'Aviation* published in 1937. The Air Staff released the first three parts of the regulation in a single volume and issued part four under a separate title. The titles—Maneuver Regulations—reveal much about the difficulty that the *Armée de l'Air* encountered in producing fundamental and organizational doctrines. The *Règlements de Manoeuvre* reflected the inter-service compromises that characterized the debates regarding the roles and missions that the air service would perform. The *Règlements* also reflected compromises within the air service regarding the nature of *lutte aérienne* and the character of modern warfare. The result of the internal and external compromises that the air service made to create an acceptable doctrine was a doctrinal emphasis on tactical concerns rather than upon strategic or operational possibilities for air power employment.

The way that the Air Staff chose to organize the four parts of the service's basic doctrine reflected an emphasis on tactical matters. The architects of the new doctrine intended Part IV to answer "all questions relating to the use of aviation...in a single regulation."⁴⁹ The first three parts of the *Règlements* by contrast described "the attributes of air force command regarding aviation instruction, the means of command and control, and aviation instruction by aircraft type" respectively.⁵⁰ In other words, the organizational scheme of the doctrine manuals emphasized *how* to employ air power

⁴⁹ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (4^e Partie) (Paris: Imprimerie Nationale, 1937): 14.

⁵⁰ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 19.

before they guided the airmen to think about *why* to employ air power.

The bottom-up approach the airmen used to present doctrine contained in the *Rèlements* reduced the potential for encountering troubling conflicts regarding the independent *lutte aérienne* within the air service. At the same time, the in-depth treatment of command relationships found in the first two parts of the regulations provided a detailed outline of the authority that remained to air commanders when they performed cooperation missions with the other services. Furthermore, by establishing policy regarding instruction and command and control before elaborating on situations that emphasized using air power's attributes, the service could assure that the institutions and infrastructure required to sustain the combat power of the Air Force had a philosophical outline from which to guide further service development. The basic philosophy that emerged from the *Rèlements* was to "prepare for war," to instill "the will to overcome," and "to teach the means of acquiring victory."⁵¹

The authors of the *Rèlements de Manoeuvre* divided *lutte aérienne* into two main categories that corresponded to the organizational roles that the air service performed. In the first category, bombardment and pursuit units allowed aviation to act as an arm of destruction for both offensive and defensive purposes. Reconnaissance and intelligence constituted the second basic organizational category in which aviation offered unique capabilities. Additionally, the doctrine anticipated auxiliary missions that aviation could perform more rapidly and effectively than other services. The auxiliary missions fell into

⁵¹ Ibid., 40.

the general categories of transport and camouflage (smokescreens, etc.).⁵² These organizational divisions allowed for a degree of consistency between the fundamental roles anticipated in the concepts of *lutte aérienne* and the tactical execution of aviation missions defined throughout the *Règlements de Manoeuvre*.

Within the scope of nominally independent air operations, the basic organizational unit was the formation. This applied to pursuit, bombardment, and reconnaissance missions regardless of the type aircraft employed. The formation remained a fixture of French Air Force organizational doctrine because of the *Armée de l'Air*'s reliance on the multi-role airplane for most of the 1930s. Formations of multi-role aircraft allowed the *Armée de l'Air* to adapt rapidly to the tactical requirements of the moment. "The ability to operate in the third dimension confers upon air power the possibility to choose the area of the most favorable winds, the economical means to acquire speed. It requires the adversary to stage his defenses, then to divide them. Finally, the different altitudes used for the routes presents several particular advantages."⁵³ The formation allowed the *Armée de l'Air* to concentrate its efforts in both offensive and defensive roles. It also allowed air forces to capitalize on the inherent flexibility of air power.

Air Force leaders argued that the key to success in modern *lutte aérienne* lay in achieving surprise using the massed aerial formations. Furthermore, French organizational doctrine emphasized the desirability of achieving a combination of effects

⁵² S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 14, 20.

⁵³ *Ibid.*, 33.

in destruction missions. The effects described in the *Règlements* contained a range of mission tasks:

Aerial maneuver should seek to obtain a rendering of the maximum available effects by combining attacks in order:

- to produce, as much as possible, the effect of surprise;
- to disrupt the alert and lookout posts;
- to divide and disrupt the enemy forces;
- to act by proportional concentrations against important targets;
- to obtain the best pattern of weapons on the targets;
- to present in all aspects the optimum defense and to halt the free play of the enemy defenses.⁵⁴

Therefore, the organizational doctrine published by the French Air Force focused on producing effects at the tactical and operational levels of war.

The *Armée de l'Air's* organizational doctrine did not purport to replace the contributions of the Army and the Navy; rather, it aimed to describe how air power could add to the efforts of the other services as they defended the nation. Yet without a clearly articulated description of how air operations supported air strategy, the French airmen failed to convince the other services that air power could make an independent contribution to the war effort. Two doctrinal failures: the failure to build upon the existing body of air power theory to create a coherent and comprehensive fundamental air doctrine, and the failure to resolve organizational conflicts with the Army, the Navy, and within the air service led to a focus on the details of tactical employment.

⁵⁴ Ibid., 69.

THE *ARMÉE DE L'AIR* AND TACTICAL DOCTRINE

Tactical doctrine in the *Armée de l'Air* derived from the broad outlines established in fundamental and organizational doctrines. Because these two doctrines contained unresolved conflicts regarding the principles of employing air power, tactical doctrine tended to remain flawed as well. Tactical air doctrine generated less controversy, however, because it was more specific and more directive in nature than were the other two doctrinal forms. Moreover, because the *Armée de l'Air's* tactical doctrine did not infringe upon traditional land and sea missions, Army and Navy leaders expressed less concern regarding the form and the substance of the Air Force's opinions about how to conduct tactical engagements.

The commander's role became the focus of tactical doctrine just as *lutte aérienne* became the focus of fundamental doctrine and the formation became the focus of organizational doctrine. Tactical commanders exercised the pivotal role in accomplishing aerial missions by exercising strict control over all tactical missions. "For all combat missions, the chief's place is at the head of the unit he commands."⁵⁵ This emphasis on personal leadership meant that the *Armée de l'Air* risked losing its best commanders in aerial combat.⁵⁶ To prepare formation commanders to cope with the risk

⁵⁵ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 113.

⁵⁶ John Keegan argues that heroic forms of leadership that rely on the commander to risk all in demonstrations of personal valor do not apply to modern forms of warfare. Although Keegan specifically addressed issues of command in the nuclear context, his observations also apply to the forms of modern warfare that the French encountered in

that leading operations entailed and to create a system that recognized and rewarded aviators with leadership potential, the air service devised a graduated system of aircrew qualification standards. Flying personnel received basic qualification training in the various flight schools. Tactical unit commanders assigned the newly qualified flyers to basic qualification crews (*non confirmé*) for entry-level tactical training. Unit commanders declared individuals fully mission ready (*bien confirmé*) after observing proficiency in tactical specialties. Finally, a crew formed of mission ready specialists received the *bien confirmé* designation, while certain crews earned the special designation of elite crew (*equipage d'élite*).⁵⁷

The French Air Force divided tactical units into flight sections of two or three airplanes. In order to mass defensive and offensive firepower, sections formed together into squadrons (*escadrilles*). Each *escadrille* contained two or three sections. Finally, two or three *escadrilles* could join to form a group. Just as each section commander controlled tactical engagements from the lead airplane in his section, group commanders flew in the lead position of each group formation. The *Règlement* prescribed that in the lead position the commander was in "the best place to make decisions which to order, according to the situation, changes in the course of the formation's flight, speed, altitude, target, modify the separation between squadrons, and even on occasion abort the

1940. See John Keegan, *The Mask of Command* (New York: Viking Penguin, Inc., 1987): 311-351.

⁵⁷ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 96-119.

mission.”⁵⁸ This conception of how to orchestrate command for aerial missions appeared similar in scope and purpose to missions conducted by cavalry units in the Army.⁵⁹

The goal in formation flight was to overwhelm enemy defenses, in the case where French air power assumed an offensive role, or to mass superior firepower to thwart an enemy aerial attack in the case of defensive operations. The commander’s role was critical to ensuring that the formations preserved tactical unity and self-defensive capabilities. “It could be necessary to arrange the specially armed and very maneuverable elements, to keep the assailants out of range; to suffer shock without weakening, and to permit a heavily loaded formation to preserve its cohesion, to pursue its route and, if the battle draws near, to present to the assailants a powerful barrier of massive and combined firepower.”⁶⁰ In times of peace, the air service expected group commanders to supervise the training, maintenance, and administration of their assigned personnel and equipment.⁶¹ At the tactical level, the French remained certain that qualified commanders could lead their crews to overcome the enemy whether in the offensive, defensive or supporting roles.

French tactical doctrine assigned destruction missions to bombardment and

⁵⁸ Ibid., 168.

⁵⁹ One staff study even explored the possibilities of combining the effects of aviation and cavalry. The author observed, “Aviation acting to the benefit of Cavalry is called to receive general missions of the same nature as those ordered by the Commander of a *Grande Unité* (*Corps d’Armée* and *Division d’Infanterie*).” S.H.A.A., Série 2B, Carton 109, “Emploi de l’Aviation en Liaison avec la Cavalerie,” n.a., n.d.: 1.

⁶⁰ S.H.A.A., Série 2B, Carton 109, État-Major de l’Armée de l’Air, *Règlement de Manoeuvre de l’Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 33.

⁶¹ S.H.A.A., Série 2B, Carton 109, “Règlement de Manoeuvre de l’Armée de l’Air, Livre II: Aviation de Bombardement,” n.a., n.d.: 10.

pursuit aviation. Because these two missions could assume both offensive and defensive qualities, they meshed with the concepts of *lutte aérienne* and the organizational structures that required the *Armée de l'Air* to support land and naval campaigns. Air service groups could include crews trained and equipped to perform both missions, or the same crews could receive individual taskings for either mission.

Tactical manuals divided bombardment operations into day and night bombardment categories. This conformed to World War I practices. The specialized training and equipment required to fly and to navigate safely at night made the distinction necessary. Night bombardment, although tactically advantageous because of the security and the inherent potential to achieve surprise, never assumed a large role in the *Armée de l'Air*. The French air service failed to provide enough trained aircrews to create a significant force of night bombing groups. In any event, the only distinction made between day and night targets in tactical doctrines centered on the visibility of the target.⁶²

French tactical doctrine included unusual recommendations for coping with enemy defenses. Enemy defenses would concentrate near the types of targets—railway lines, electrical power facilities, roads, airfields, ships, port facilities, and enemy

⁶² The commission appointed to study and report on the *Armée de l'Air*'s performance in the Battle of France noted the lack of night qualified bomber crews. The inability of French pilots to fly in low visibility conditions (*pilotage sans visibilité*) also hampered French night bombing operations in the spring of 1940. See S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 78-79.

industrial areas—proposed by the French tacticians.⁶³ Bomber tactical prescriptions instructed crews to vary their attacks according to the disposition of enemy defenses in the immediate target area. The authors of the tactical manuals noted that low altitude strikes tended to achieve better accuracy than those attempted at high altitudes. Crews could choose to envelop the target using a concentric circling maneuver, to attack along the longitudinal axis of a target, or to attack across the axis of a target. Moreover, the tactical doctrine specified that the mission commander could direct the airplanes in his formation to adopt different strike tactics against the same target—at the same time—to confuse enemy defenders.⁶⁴ Tactical doctrine appeared based upon an article of faith that a successful bombardment mission occurred when the bombers reached the target and dropped their weapons in the general area; discussions of accuracy and targeting science did not figure in tactical doctrine publications.

The *Armée de l’Air* planners devoted much time and energy to identifying and prioritizing enemy targets for bomber target lists. In the early 1930s, bombardment targets reflected French fears that German aerial attacks would focus on civilian population centers. French plans included attacks against *Objectifs Militaires et de Représailles* to erode German popular support for aggressive government policies while simultaneously bolstering confidence among French civilians. Air Force planners anticipated that “repetitive incursions of bombers, even if not accompanied by effective

⁶³ S.H.A.A., Série 2B, Carton 109, “Règlement de Manoeuvre de l’Armée de l’Air, Livre II: Aviation de Bombardement,” n.a., n.d.: 26-38.

⁶⁴ S.H.A.A., Série 2B, Carton 109, État-Major de l’Armée de l’Air, *Règlement de Manoeuvre de l’Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 82.

destruction, will rapidly obtain results" among the German work force.⁶⁵ The planning staff selected 109 German towns as possible reprisal targets; they developed detailed target dossiers on 53 of those towns.⁶⁶

Railway lines presented particular problems for bombardment forces. Small errors in bomb placement could result in little damage to the tracks and roadbeds. If planners selected the wrong ordnance, repair crews could put the line back in service quickly. Air service leaders charged the *Centre d'Expériences Aériennes Militaires* at Reims to recommend the most effective tactics for railway attack missions. Flight test personnel concentrated on low altitude (*vol rasant*) and shallow dive bombing (*attaques en léger piqué*) experiments using a variety of aircraft speeds. A second set of experimental variables involved attacks across the axis and in parallel with the axis of the rail line. The experiments revealed that the air service required special training procedures and tactics to achieve optimum results against rail networks. The bombardiers could not depend on conventional bomb sighting equipment, the pilots could not fly standard bomb run profiles, the munitions personnel could not load standard fuses. Many of the bombs dropped in the experiments missed the tracks because they ricocheted after striking the ground. Other bombs exploded prematurely or failed to explode at all.⁶⁷

⁶⁵ S.H.A.A., Série 2B, Carton 67, État-Major de l'Armée de l'Air, 2^o Bureau, "Renseignements préliminaires d'ordre général sur l'importance et la vulnérabilité des objectifs militaires et de représailles," 11 January 1939: 5-6.

⁶⁶ Ibid.

⁶⁷ S.H.A.A., Série 2B, Carton 110, Capitaine Secrétaire, Centre d'Expériences Aériennes Militaires—Assaut, "Rapport d'Ensemble, Questions Nos A3 et A5: Procédés de Destruction des Voies Ferrées par l'Aviation d'Assaut," 15 Apr 1939. The Air Staff produced a detailed analysis of the German rail network. See: S.H.A.A., Série 2B, Carton 65: Renseignements concernant les chemins de fer allemands: 1930-1940.

Despite these difficulties, the Germany railway network remained an important tactical bombardment objective.

Electrical power generating and transmission facilities supported critical military and industrial targets. French bombardment planners began collecting information on the German electrical industry as early as 1926.⁶⁸ According to the Air Staff, it was possible "to determine for each large industrial region in the Reich...a certain number of public or private thermal plants, transformers, and hydro generators which, if attacked simultaneously, will permit the *isolation* and disorganization of the total system of production in these regions."⁶⁹ Once again, French planners prepared 58 detailed target dossiers that included photographs and navigation charts for the most important of these targets.

French tactical doctrine also included a role for Bombardment aviation in the air superiority battle. The self-defending bomber formation could contribute to this mission in two ways. First, the bombers could wage a campaign of attrition against German pursuit and bomber forces as they encountered the enemy en route to targets in German territory. This legacy of the B.C.R. era remained a permanent fixture of French tactical doctrine. Destroying the enemy Air Force on the ground represented the second method French airmen planned to use to gain air superiority. French planners identified 227 airfields as targets for bombardment missions. But destroying a few airplanes on the

⁶⁸ See Série 2B, Carton 69, Dossiers d'objectifs: 58 dossiers d'installations électriques allemands: 1926-1940.

⁶⁹ S.H.A.A., Série 2B, Carton 65, "Sources d'énergie électrique allemandes: Répertoire des sources d'énergie électrique allemandes, note préliminaire," Dossier 1: 21 Jun 1939: 14-16.

ground did not solve the problem presented by the German aviation industry.

Consequently, the Air Staff analyzed the aeronautical industry resulting in a report that identified over 500 separate target objectives. Staff analysts divided the components of the industry into four broad categories: Fuselage and Components Factories, Secondary Fuselage Factories, Important Motor and Secondary Motor Factories, and Miscellaneous Important/Secondary Factories. Curiously, however, the last category received the most attention with 52 target dossiers compared to only three dossiers for the Fuselage and Component Factories.⁷⁰

Despite the detail and the level of analysis contained in the bombardment dossiers developed by the Air Staff before the war, the *Armée de l'Air* never displayed more than a passing tactical interest in such targets. The most important concern, doctrinally, turned gradually from the air power's potential to affect enemy moral and material abilities toward measures designed to support friendly Army units along the frontier. The French bombardment arm stopped short of forging a conceptual and doctrinal connection between the theory of *lutte aérienne* and the vulnerabilities contained within the various target sets represented in the bombardment dossiers. Army demands for air support prevented serious consideration of systematically attacking any target that did not relate directly to the outcome of the terrestrial battle. This condition also applied to pursuit aviation units.

The tactical doctrine for pursuit aviation remained dependent upon the skills and intuitions of the fighter pilots who manned this arm. Pursuit pilots practiced maneuvers and patrol procedures that differed little from the basic flight methods used in the Great

⁷⁰ S.H.A.A., Série 2B, Carton 64, Dossier 1, 15 Mar 1938.

War. The destruction of enemy air forces and the maintenance of air superiority defined the outlines of pursuit tactical doctrine. The only variation in mission content for pursuit groups concerned who delegated mission taskings. Pursuit units could operate under the orders of Air Force commanders, Army commanders, or *Défense Aérienne du Territoire* (D.A.T.) commanders. The D.A.T. organization controlled air defense and alerting networks during peacetime. As the armed forces mobilized, D.A.T. forces merged their responsibilities and capabilities with the Army and the Air Force. Regardless which organization required pursuit support, the tactical structures of the missions conformed to similar formulas.

Three types of missions applied when pursuit units supported land operations: security (*couverture*), protection, and free pursuit.⁷¹ Security operations tied pursuit patrols directly to land maneuver units. Mission tasks centered on defeating enemy pursuit and bomber attacks against friendly troop concentrations. Pursuit also operated to prevent enemy reconnaissance aircraft from observing French troop movements in the *couverture* role. Patrol discipline formed a critical doctrinal principle for the *couverture* mission because pursuit received mission assignments from specific Army units. Patrol leaders observed enemy formations to determine if they threatened the assigned Army unit before attempting to engage the enemy patrol. If the French patrol commander could bring other defensive units to bear (artillery or free pursuit units) by notifying command echelons, the patrol would avoid aerial combat. If the patrol commander perceived,

⁷¹ S.H.A.A., Série 2B, Carton 109, "Plan de l'Instruction Pratique," n.a., n.d.: 3.

however, that the enemy formation represented a threat to the unit that he protected, he committed his patrol to intercept the enemy airplanes.⁷²

Protection missions differed from *couverture* in that they tied assigned pursuit patrols to protect friendly airplanes and observation balloons rather than Army formations. Units assigned to this mission operated with more freedom than did units assigned to protect land combatants. Pursuit units operating in a protective role were free to attack any enemy aircraft that entered their assigned protection zones. The critical rule for protection missions stated that pursuit patrols should not become so distracted when chasing an enemy patrol that crossed their zone that they allowed an undetected enemy to attack an aircraft or balloon under their protection. To prevent this occurrence, pursuit patrols usually worked together in pairs or in groups.⁷³

Free pursuit missions allowed the pursuit patrol to search for the enemy within the theater to the limits of his operational range. This option allowed the maximum tactical flexibility and initiative while, theoretically, instilling the greatest fear and uncertainty in the enemy air forces. Patrols involved in free pursuit could also augment bombardment formations that targeted enemy airfields by surprising enemy pursuit patrols as they attempted to intercept the French bombers.⁷⁴

D.A.T. pursuit missions resembled the tactical categories defined in the land support role. Pursuit units could provide direct security, oriented security,

⁷² Ibid., 74.

⁷³ Ibid., 77-83.

⁷⁴ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, "Règlement de Manoeuvre, Livre I, Aviation de Chasse, Titre I, Règlement," Tirage provisoire 1938: 18.

contact/concentration, and night pursuit under D.A.T. control. Direct security ensured the protection for a specific target area or feature. This resembled the *couverture* role performed by pursuit units assigned to an Army zone of operations. Oriented security differed from direct security by grouping several important targets into a patrol zone. Contact/concentration involved observing enemy formations and reporting their movements to the D.A.T. lookout network. Finally, night pursuit operations combined the D.A.T. searchlight and lookout network with pursuit patrols to detect and intercept enemy formations.⁷⁵ Pursuit aviation remained the most tactically independent of all French aviation categories. Army commanders agreed that the primary mission centered on gaining air superiority. The same did not apply to the observation units that provided aerial reconnaissance to Army and *Armée de l'Air* headquarters as the land campaign unfolded.

If pursuit aviation represented the most independent tactical expression of air power in the *Armée de l'Air* of the 1930s, reconnaissance aviation represented the airpower component that remained tied most closely to Army needs. The air service used the term *aviation de renseignement* to encompass three categories of aviation missions. Reconnaissance and observation missions involved two closely related information-gathering missions. Reconnaissance involved the search for information regarding enemy movements and activities. Observation aviation involved maintaining contact with enemy forces and reporting changes in their disposition. The final category of

⁷⁵ S.H.A.A., Série 2B, Carton 109, "Plan de l'Instruction Pratique," n.a., n.d.: 4, 92-115.

reconnaissance aviation, liaison missions, required aviators to observe and adjust artillery fire missions along the front.⁷⁶

Aerial reconnaissance and surveillance of the battlefield emerged in the early battles of World War I and remained a fixture of air power employment throughout that conflict. Army commanders refused to allow this capability to erode in the *Armée de l'Air* of the interwar years. The Army successfully lobbied to force the air service to make aerial reconnaissance a secondary tactical mission for pursuit and bombardment formations. The *Règlement de Manoeuvre* specified that all aircrews "will search in an assigned zone for information necessary for air operations and for combined operations with the Army and the Navy."⁷⁷ Although the authors of the *Règlements* made a token attempt to relate reconnaissance missions to the needs of the *Armée de l'Air*, virtually the entire discussion of reconnaissance missions, 95 pages, centered on how to execute such missions while supporting land or sea operations.

The essential features of successful reconnaissance missions involved processing and transmitting data obtained through aerial surveillance to the appropriate command echelon. The data came in several forms. The least technically complicated form was a verbal or written report submitted by the aircrew upon completing a mission. Debriefing personnel conducted a post-flight interview using standard questionnaires; after completing the interview, the tactical unit forwarded written reports to higher command echelons. The three-part written report included mission information about the airplane,

⁷⁶ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (4^e Partie)* (Paris: Imprimerie Nationale, 1937): 140-141.

⁷⁷ *Ibid.*, 140.

the crew, and flight conditions, a chronological account of the information obtained in the course of the flight, and a detailed tactical description of the enemy units observed.⁷⁸

Tactical units usually collected all reports for a single day before forwarding them to the next level in the chain of command.

Photographic data afforded confirmation of suspected enemy activity. Aviators took great risks to gather high quality aerial photos of enemy movements. Like the verbal or written reports, however, photographic data often arrived at the higher echelons after significant delays because of the developing processes at the tactical units.

Photographic data also introduced a level of uncertainty and complexity to the information-processing task. Trained interpreters had to identify positively the location and the types of information on the photographs. Photos could also mislead even trained interpreters if the aircrew failed to properly relate the route of flight used to obtain the photographs. Enemy countermeasures, camouflage and deception, could complicate the interpreters' task resulting in erroneous conclusions regarding the information in the photographs.

Finally, data could arrive at ground units through radio or message transmission. This method did not become universally available to the French air service during the 1930s. Some reconnaissance units resorted to dropping messages from their airplanes as they flew over their assigned headquarters during the Battle of France because their

⁷⁸ Ibid., 146-147.

aircraft did not have radios or their radios were incompatible with Army communication equipment.⁷⁹

The doctrine development process in the *Armée de l'Air* followed a complex path filled with difficult issues that brought air service leaders into conflict with their counterparts in the Army and the Navy. The airmen articulated a fundamental doctrine that included a vision for air power that embraced the defensive doctrine that prevailed in the Army. The *lutte aérienne* structure also accommodated offensive employment possibilities for aviation that promised to allow French strategists to seize the initiative within the context of a campaign in which the French maintained a strategic defensive posture. The offensive component of *lutte aérienne* threatened to ignore Army and Navy requirements for aviation assets; therefore, land and sea service leaders waged a successful campaign to place air commanders in subordinate roles whenever the services engaged in joint operations. The resulting flawed organizational doctrine destroyed the authority of air commanders and left them to act as technical advisers to land and sea service commanders rather than as equal participants in developing operational strategy. The airmen fared no better when they tried to develop tactical doctrines. The flawed fundamental and organizational formulas caused *Armée de l'Air* leaders to couch all air service tactical missions in terms of cooperative missions. Thus, the pressures to conform to the needs of the sister services left the Air Force incapable of planning or executing independent missions. The *Armée de l'Air* reacted at the strategic, operational,

⁷⁹ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 99.

and tactical levels of war because doctrine demanded it. The same doctrine formed the conceptual foundation for the training system that prepared airmen for war.

CHAPTER 4

A TRAINING SYSTEM FOR A REACTIVE AIR DOCTRINE

We consider an Air Force. It is not only the warplanes, armed and crewed, prepared for combat, but a service fleet, destined for the formation of pilots, for their training, the technical services for the transport of troops, for liaisons of all sorts of indispensable tasks for the life of this force.¹

The training system that the leaders of the *Armée de l'Air* established during the 1930s reinforced the reactive character of the service's doctrines. Airmen created training institutions and programs designed to prepare the service to fight the type of war anticipated in the fundamental, organizational, and tactical doctrines. The doctrine represented the consensus among air service members regarding how best to use air power to serve France's strategic, operational, and tactical needs. Air Force leaders developed a training system designed to forge an aerial weapon capable of fulfilling the promise of their doctrines.

After serving as Air Minister in the Popular Front government, Pierre Cot stressed the importance of the training system. He wrote, "In every case, the superiority of our armaments, of our crews, of our trained reserves, and our staffs has compensated, very

¹ Pierre Cot, *L'Armée de l'Air, 1936-1938* (Paris: Éditions Bernard Grasset, 1939): 48.

quickly, for German superiority.”² Thus in Cot’s eyes, and in the eyes of his colleagues in the Air Ministry and the Air Staff, the training system would serve as the great equalizer in the race to forge a modern aerial weapon. Unfortunately, the air service’s tendency to react to events found its way from the doctrine into the training system and made the training programs one of the greatest obstacles to achieving combat effectiveness.

The core of the *Armée de l’Air*’s training programs lay in a variety of procedural, organizational, and physical traits that imparted structure to the system. At the procedural level, frameworks evolved to transform doctrine from abstract concepts into concrete instructions. These frameworks in turn guided activities designed to prepare the Air Force for war. Procedural characteristics ranged across a spectrum of personnel, recruiting, resource management, and operational issues. Organizational characteristics defined ways that the *Armée de l’Air* managed procedural matters. Finally, the institution assumed form and substance by matching the established organizations and procedures against resources, personnel, and material to accomplish assigned tasks and missions. These three characteristics of the air service’s training system, conceptual, organizational, and physical, influenced, and ultimately reinforced the *Armée de l’Air*’s reactive nature during the interwar years. This prevailed not solely because of internal decisions—to suggest that any institution in interwar France was complete master of its fate would be

² Ibid., 68.

ludicrous—but because of the ways in which Air Force leaders chose to function within the constraints of their political, social, and cultural context.³

The system of technical schools in the French Air Force became one of the most important vehicles used to transmit and reinforce institutional norms, values, and doctrines to the men who manned the service's units. A well-developed school system was essential to building the air service in the years after the service gained independence from the Army and the Navy because of the high degree of technical knowledge required to operate aerial combat systems safely and effectively.⁴ The leaders of the *Armée de l'Air* relied upon a logical, managerial approach to impart structure and credible combat capability to the various components of the published air doctrines. But the competition for air power resources that caused the fundamental, organizational, and tactical doctrines to assume a reactive character filtered into the institutional structures of the training system. The result was a training system, like the doctrines it served, that shifted with the

³ On the political and economic challenges encountered by the leaders of the Third Republic see Philippe Bernard and Henri Dubief, *The Decline of the Third Republic, 1914-1938*, trans. Anthony Forster (Cambridge: Cambridge University Press, 1985). Patrick Facon explains that the French dreamed of an aerial alliance with the Soviet Union as one solution to the rise of German power in Patrick Facon, *L'Armée de l'Air dans la tourmente: La bataille de France, 1939-1940* (Paris: Economica, 1997): 20-23. Thierry Vivier shows how the Franco-Czech alliance also drew French attention during the 1930s. See Thierry Vivier, "La coopération aéronautique franco-tchécoslovaque (janvier 1933-septembre 1938)," *Revue historique des armées* (March 1993): 70-79.

⁴ Air power scholars comment on the technical sophistication required of airmen and its effects on how doctrines and institutional structures develop. Carl Builder's analysis of the United States Air Force shows how too much emphasis on technical matters can lead to stagnant doctrines and to intellectual atrophy. See Carl H. Builder, *The Icarus Syndrome* (New Brunswick, NJ: Transaction Publisher, 1996). See also David MacIssac, "Voices From the Central Blue: The Air Power Theorists," in Peter Paret, ed., *Makers of Modern Strategy From Machiavelli to the Nuclear Age* (Princeton: Princeton University Press, 1986): 624-647.

winds of interservice rivalry, political instability, and strategic and operational uncertainty.

Several elements reinforced the tendency toward the reactive posture in the training systems operated by the French air service. The first was the structure of the system. The school system that evolved in the 1930s did not derive from a master vision of modern war, but from a constant balancing of national defense and economic concerns. Although the authors of the fundamental doctrine had described the complexity of modern aerial warfare in terms of a single *lutte aérienne*, more often than not the training system emphasized preparations for the defensive and cooperative components of that battle thus leading to a neglect of independent operational concepts.

The second element that exacerbated the reactive nature of the training system related to the necessity on the part of the air service to balance its intellectual and technical requirements against the personnel available for service. The Air Force needed dedicated, intelligent recruits to fill the cockpits and maintenance hangars of its tactical units. Entry into the Air Force required satisfactory scores on a wide-ranging battery of tests. Applicants for officer and non-commissioned officer positions received examinations in French Composition, Language and Literature, History, Geography, Arithmetic, Algebra, Trigonometry, Geometry, Physics, Chemistry, and Foreign Languages.⁵ For most of the decade, the leaders of the air service struggled to manage personnel requirements and, simultaneously, to maintain a high level of quality in the

⁵ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major Général de l'Armée de l'Air, 1^{ère} Section, "Jurys d'examen: Candidats à l'École de l'Air—Cours des sous-officiers élèves officiers en 1936," 27 January, 1936: 2-7.

training programs. This struggle pushed them toward a reactive training posture.⁶

Finally, as French grand strategy drifted from one crisis to another, the Air Force training system followed, struggling to produce combat crews and trained support personnel to fulfill the strategic and operational missions the government demanded.⁷

The picture that emerges from an analysis of the documentary evidence of the training system is one of chaos and uncertainty. The mounting pressure of international political tension after 1936, coupled with the shock waves of domestic political turmoil in 1934, 1936, and 1938 sowed chaos in the training system. The Air Force had to alter the training system as national leaders altered their perceptions and strategies of how to cope with the German threat. The debates over the proper role for aviation in the context of national defense sowed uncertainty in the institutional structures that the service relied upon to indoctrinate new members. The surprising outcome of the story is not that the *Armée de l'Air* performed poorly in combat, but that it performed as well as it did. The

⁶ The *Armée de l'Air* experienced effects similar to those of the Army after the government decided to shorten the duration of mandatory service. The key difference was that because of its reliance on highly skilled and personnel to fill most specialties, the Air Force experienced more chronic shortages, especially in the numbers of combat-ready instructors, throughout the 1930s than did the Army. Eugenia Kiesling writes: "The fundamental weakness of French military training came from the army's structure. For organizational reasons, the army could not simultaneously provide basic training for recruits and advanced work for the trained portion of the conscript contingent." For a thorough analysis of the effects of the personnel policies on Army training efforts see Eugenia C. Kiesling, *Arming Against Hitler: France and the Limits of Military Planning* (Lawrence, KS: University of Kansas Press, 1996): 62-84.

⁷ Patrick Facon describes the ways that French strategy affected the air service's requirements for operational specialties. The aviation missions changed depending upon the preferences of the government in power. At times, the politicians emphasized aerial bombardment as the solution to French strategic problems; at others, air superiority and pursuit aviation appeared to be the operating method preferred by government leaders. See Facon, *L'Armée de l'Air dans la tourmente*, 35-65.

combat record of the French air service against the Luftwaffe in 1940 remains a testament to the courage and tenacity of French airmen rather than a product of the quality and effectiveness of their training and education institutions.

THE TRAINING SYSTEM

The training system began as an integral element of the published service doctrines. The *Règlements de Manoeuvre de l'Aviation* represented the most accessible basic statement that described how the air service intended to prepare its new members to perform doctrinal missions. Doctrine established a central role for the Air Ministry and the Air Staff in designing, administering, and evaluating the various schools that came to comprise the system. According to organizational doctrine, the role of the Air Ministry was to assure "the coordination of programs concerning common instruction for Air Force personnel...camps for instruction and fields for application and fire instruction; reserve credits; and the essential fuels required for the formations [of the service] to function."⁸ Thus, the Air Ministry became the central clearinghouse for all instructional system matters. Air Staff personnel at the Ministry established training policy, regulated funding, managed personnel assignments, and evaluated the performance of the various training schools in the system.

With the complexity of the training systems required by the *Armée de l'Air* came

⁸ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties) (Paris: Imprimerie Nationale, 1937): 19.

a correspondingly complex personnel management system that tracked the progress of recruits, reserves, and units. The Inspector General of the Air Force controlled “the execution of the orders and directives of the Minister regarding every activity dedicated to preparing the *Armée de l’Air* for war.”⁹ The Inspector General’s authority was not absolute, however. He shared responsibility for administering the various combat training programs with the Inspector General in charge of Territorial Air Defense (*Défense Anti-Aérienne du Territoire*, or D.A.T.). This administrative burden sharing was necessary because of the doctrinal and physical separation of the *aviation légère de défense* that comprised the D.A.T. units from the mainstream air commands. Together, the two Inspectors General exercised authority over “all propositions concerning Air Force instruction, in the schools as well as in the tactical units (*formations*).”¹⁰ Colonial aviation required a further division of administrative responsibility for training and education programs owing to the remoteness of the colonies and the differences in equipment and operational missions. The division of missions coupled with the Air Force’s desire to retain unity of command over its personnel and equipment created confusion throughout the 1930s prompting repeated meetings between the Air Force Inspector General and his D.A.T. counterpart.¹¹

Outside the centralized Air Staff bureaucracy, subordinate commanders exercised responsibility for training and instruction—in principle. Confusion over this responsibility stemmed in part from changing emphases in the *Armée de l’Air*’s tactical

⁹ Ibid., 20.

¹⁰ Ibid., 20.

¹¹ See S.H.A.A., Série 2B, Cartons 10 and 20 for examples of issues that required coordination between the two Inspectorates.

roles at various points during the decade. These changes, in turn, derived from the changes in the political fortunes of the various Air Ministers between 1933 and 1940. Pierre Cot reorganized the command structure and the supporting staff roles for the air service to emphasize the potential that air power could bring to bear on Germany through independent air operations. He created five regional air commands that corresponded roughly to the Army's military regions. In addition to their wartime roles, the combatant commanders exercised education and training responsibility over the forces assigned to their regions, over the logistics specialties tasked to support the frontline units, and over the reserve units that trained and reported to their regions for mobilization. This all-encompassing responsibility meant that the regional air commanders saw to the details of training camps, gunnery ranges, wargame and exercise planning, and coordination with the Army and Navy commanders who looked to the air service for cooperation and support.

At the most elementary level, airmen acquired formative instruction designed "to make each student gain the necessary knowledge of his function on the crew."¹² Once a prospective aircrew member successfully completed the formative phase of his training, he moved on to applied instruction. This form of continuation training emphasized "training in combat operations; principles, functions, and procedures for employing new materials; increased proficiency; and instructor training."¹³ Formative training occurred at various bases scattered throughout metropolitan France while applied instruction usually remained the responsibility of the tactical units. Regardless of the type or

¹² Ibid., 41.

¹³ Ibid., 41.

location of the training, however, the Air Staff established the content and the duration of the syllabi.

The centralized management of the training system that began with the Ministerial-level policy guidance broke down as the components of the system, the various schools and training bases, evolved in the 1930s. Ultimately, the leaders of the air service found themselves in the unenviable position of managing many small technical schools scattered throughout the French countryside. Those schools that conducted flight training further distributed air resources by establishing the headquarters and administrative support sections at the designated training base and then creating small training fields in outlying areas where detachments of instructors and students accomplished the flying training portion of the curriculum.

One Air Staff chart depicted the organization of the flight school system in three of the five air regions.¹⁴ The top of the chart shows thirty *Écoles Élémentaires*, or basic flight schools. After students completed the basic flight course, they moved to one of eight *Écoles Auxiliares* for more advanced flight procedures training. From the *Écoles Auxiliares*, students graduated to attend one of two *Écoles Principales*; this represented the final stage of flight training before students received assignments to one of three main combat specialties. The commander of the *École Principale* was responsible for “technical and aerial military instruction directives” in all three levels of the basic flying

¹⁴ S.H.A.A., Série 2B, Carton 10, “Schema d’Organisation des Écoles de Pilotage,” n.a., n.d.

training system.¹⁵ After graduating from the *Écoles Principales*, students gained specialized training in pursuit, bombardment, or reconnaissance flying procedures at one of several *Centres d'Instruction*. There were two pursuit *Centres*, four bombardment, and three reconnaissance *Centres* distributed among the various air regions. Thus, as students traveled through the various stages of flight training in the 1930s, they changed bases at least four times before reaching their first tactical unit as qualified aircrew members.

Aircrew training was not the only type of training conducted by the *Armée de l'Air* in the years before World War II. The air service needed recruits who could complete a rigorous program of instruction to become aircraft mechanics, civil engineers, radio operators, photographic technicians and interpreters, and intelligence specialists. Recruiting efforts to attract young men to the air service emphasized the practical benefits derived from the sophisticated technical skills gained in the *Armée de l'Air*'s training system. A recruiting poster that detailed the procedures for obtaining certification as an aircraft electrician (*Mécanicien d'Aéronautique, Spécialité: Aviation—Mécanicien-Électricien*) addressed "young men who wish to serve the full duration of their legal service" in the *Armée de l'Air*.¹⁶ The poster touted the practical advantages of skills gained in the air service. "Because of the strong scientific culture and the practical professional experience acquired, those young men who hold the Aeronautical

¹⁵ S.H.A.A., Série 2B, Carton 10, État-Major de l'Armée de l'Air, 3^{ème} Bureau, "Fonctionnement des Écoles Élémentaires de Pilotage," Message 10,060-3/I.S/EMAA: 4.

¹⁶ S.H.A.A., Série 2B, Carton 10, "Comment Obtenir le Brevet Supérieur de Mécanicien d'Aéronautique," n.d.: 3.

Electrician's diploma possess, upon completion of their service, a true profession that embraces mechanics, electrics, and radiotelegraphy as well as greater abilities that will permit them to aspire to higher paying civil positions in their specialty."¹⁷

In addition to the deferred advantages of possessing a license that granted entrance into a profession, the recruiting poster added that there were "pecuniary advantages" available. Volunteers who signed a four-year contract received a bonus of 3,250 francs and those who opted to serve for five years received 4,550 francs above their daily pay. Moreover, the service offered the promise of regular promotions, with accompanying pay raises, for those who found life in the air service to their liking. Those who adapted well to military life in the course of their technical training could receive promotions to the rank of corporal upon graduation with an additional promotion to sergeant after five months of satisfactory service. Ultimately, the most enterprising recruits could work their way through the enlisted and non-commissioned officer ranks to become officers. Similar offers applied to potential recruits in the radio operator, gunnery (*radiotélégraphiste* and *mitrailleur*) and pilot career fields. The only exception to the standard recruiting formula for pilots was the addition of a daily bonus, the expansion of the four and five year bonus to include recruits who signed on for two or three years, and a separate pay scale that granted higher daily pay amounts for pilots than for personnel in non-flying specialties.¹⁸ The message that these recruiting advertisements communicated was that the air service needed dedicated recruits who

¹⁷ Ibid.

¹⁸ S.H.A.A., Série 2B, Carton 10, "Comment Devenir Radiotélégraphiste en Avion," "Comment Devenir Mitrailleur," "Comment Devenir Pilote d'Avion," n.d.

were willing to make a long-term commitment to the *Armée de l'Air*. The service was willing to offer tangible as well as intangible compensation those who were willing to trade several years of their lives for high quality technical training.

The goal of the *Armée de l'Air*'s training system centered on instilling problem solving and critical thinking skills rather than passing on an approved staff solution to operational and tactical problems.¹⁹ The organizational doctrine specified five categories of instruction: morale education, general instruction, military instruction, technical instruction, and instruction on liaison with land and sea forces. Lessons progressed through a series of lectures, demonstrations, and practical problems. Throughout the process, instruction in the training system targeted every aspect of the airman's professional life.

Morale education formed the basis for all other categories of Air Force instruction. The conditions of aerial warfare, even in multiplace crew airplanes, tended to isolate the individual. The fear that this isolation provoked could intensify with the knowledge that French airmen fought from a position of numerical and technological inferiority. Therefore, morale education programs sought "to develop among all flying personnel a spirit of unfailing sacrifice, devotion, and discipline, combined with a keen sense of responsibility and thorough comprehension of the mission."²⁰ When the pressures of combat came, French airmen could rely upon the lessons of discipline, patriotism, and sacrifice along with a shared sense of purpose to bolster their courage.

¹⁹ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 42.

²⁰ Ibid., 50.

The architects of the training system recognized that morale education was just as important for non-flying personnel as it was for the flight crews. The *Règlements* pointed to the positive effects gained from a well-defined sense of purpose and mission. The symbols of the nation, national holidays, and significant unit accomplishments instilled a sense of personal connection to the unit mission and to the greater purpose of national defense. Commanders and subordinates alike shared in the responsibility of cultivating this awareness of the role that their unit and the *Armée de l'Air* at large played in national defense. "The purpose of morale education," for all Air Force personnel was, therefore, "to exalt patriotism, to inspire confidence, to develop an understanding of the necessity of discipline, and to develop feelings of solidarity and *esprit* within the unit."²¹

General education served rational purposes just as morale education served emotional purposes. The two were not, however, mutually exclusive. General education focused on developing an understanding among airmen of the nation's strategic and operational circumstances. This related directly to the morale education objective of cultivating mission awareness. In a broader sense, however, this type of training was necessary because of the rather isolated character of the French citizenry. As Eugen Weber argues, France remained a rather fragmented country until late in the nineteenth century. Even in the 1930s, Frenchmen tended to focus on local rather than on international concerns.²² New recruits brought this focus on local concerns to their

²¹ Ibid., 51.

²² See Eugen Weber, *Peasants into Frenchmen: The Modernization of Rural France, 1870-1914* (Stanford, CA: Stanford University Press, 1976). Eugen Weber, *My France: Politics, Culture, Myth* (Harvard University Press, 1992). Eugen Weber, *The Hollow Years: France in the 1930s* (New York: W. W. Norton and Company, 1994). Laurence

experience in the air service. Therefore, the leaders of the Air Force sought to provide a training system that educated service members on the outlines of geography and European politics, national defense policies, the general principles of land, air, and sea power employment, and the latest advances in military technology.²³ The Air Force was thus not just a military institution; it became an engine of social advancement and change.

For Pierre Cot, the *Armée de l'Air*'s potential as an instrument of social progress was one of the most important functions the service could perform for the nation. Cot attempted to accelerate the socializing role by instituting regularly scheduled lecture series followed by required writing assignments for the regular officer corps. By forcing the air service officers to encounter and write about stimulating and controversial subjects, Cot hoped to make the *Armée de l'Air* "a laboratory of ideas, technical, and tactical conceptions."²⁴ As French airmen thus became world leaders in aviation thought, France would resume her rightful place as the world leader in political, social, and cultural matters.

As the training syllabus moved from the affective (*éducation morale*) and the intellectual (*instruction générale*) to more practical forms, training objectives assumed characteristics akin to those of traditional military training programs. *Instruction militaire* included physical education, drill, and specialty instruction. Military aviation

Wylie also reinforces this theme in a twentieth century context. See Laurence Wylie, *Village in the Vauchuse, Third edition* (Cambridge: Harvard University Press, 1977).

²³ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (1^{ère}, 2^e, et 3^e Parties)*, (Paris: Imprimerie Nationale, 1937): 54.

²⁴ Cot, *L'Armée de l'Air*, 159.

presented unique physical challenges to the airman. To prepare airmen and support personnel to meet those challenges, Air Staff regulations specified a complete regime of regular physical fitness activities for all air service personnel. "A physical education lesson, occurring before the duty day begins for all personnel, lasting from thirty to forty minutes will be given each day by qualified instructors. Officers and non-commissioned officers under the age of 35 years will participate."²⁵ The goal was to maintain a cadre of airmen that could perform under the stress of fast-paced combat air operations involving aerial maneuvering as well as long duration, high altitude flight. For the non-flying specialties, physical education instruction prepared support personnel for long, stressful hours of intense combat operations. Calisthenics, running, gymnastics, and swimming comprised some of the activities the Air Staff advocated to ensure that physically capable airmen manned the air service.

The Air Staff deemed the physical education of airmen important enough to consider creating a specialized training school near Chambéry. According to the Air Staff proposal, the school would provide "instruction for career officers and non-commissioned officers in physical education and sports." The proposed location near alpine skiing areas would have afforded the opportunity "to form [a cadre] of instructors for winter and water sports."²⁶ The school's three-month long winter sports program could accommodate twenty-five officers who, after completing the course, would return

²⁵ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 57.

²⁶ S.H.A.A., Série 2B, Carton 11, État-Major de l'Armée de l'Air, 1^{ère} Bureau, "Groupe d'École de Chambéry," Message 1773-3-I/O/E.M.A.A.: 2-6.

to their units as *instructeurs d'éducation physique*. The five best officers from each year's course would remain for an additional month and a half of specialized training. The proposal called for a similar four-month program to produce thirty non-commissioned officer physical education instructors. The lack of money and the limited utility of a school designed to operate only during the winter months called the basic premise of the proposal into question. Nevertheless, the example of the proposal for a physical education school at Chambéry illustrated the importance the Air Staff placed on attempting to provide qualified instructors and facilities to ensure the physical fitness of air service members.

Technical instruction gave air service members the requisite skills to perform in their particular military specialty. For flight crews, technical instruction occurred in special ground courses as well as in regularly scheduled flight training. Meticulous ground preparation was necessary for successful performance in flight operations. Or, as the authors of the *Règlements* observed, "Preparatory instruction on the ground is the best guarantee of good results in the air."²⁷ Preparation for technical instruction focused squarely on mission and task accomplishment. There was little room in either flight or ground activities for speculation or theory.

Tactical instruction continued to focus on applying the special skills of air combat and combat support to specific scenarios. Airmen began their tactical instruction with a thorough review of relevant air, land, and sea regulations. If necessary, the areas of confusion that arose in this review received clarification in a group discussion of the

²⁷ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation*, (1^{ère}, 2^e, et 3^e Parties), (Paris: Imprimerie Nationale, 1937): 64.

principles in question using an historical case to illustrate key points. Map exercises followed the regulation discussion. These exercises allowed the participants to simulate specific tactical scenarios. The focus was on deploying air resources, tactical maneuvers, intelligence gathering, communications planning, and logistics. This type of exercise allowed unit members to practice all the roles required of air service personnel in wartime with respect to receiving and processing orders, planning air operations, and working with other air, land, or sea combat forces. After each map exercise, the participants convened to conduct a collective after-action review of the unit's performance.²⁸

The final category of instruction focused on air operations in concert with land and sea forces. The *Règlements* anticipated some of the difficulties that could occur when the *Armée de l'Air* functioned in a joint service context. The objective of such exercises in peacetime was to allow members of each service to develop an understanding of how to combine their various combat specialties effectively. In reality, the *Armée de l'Air* feared that the Army and Navy would undermine the authority and the autonomy of air commanders. For this reason, the doctrine specified "every Air Force element that participates in exercises with cadres, corps, or divisions of the Army shall be represented by its chief."²⁹

The five categories of instruction specified in the *Règlements de Manoeuvre de l'Aviation* provided the framework around which all air service training programs revolved. At the unit level the Air Staff divided the calendar year into two training periods. In the winter months (November-April) air education focused on gaining the

²⁸ Ibid., 67-69.

²⁹ Ibid., 74.

necessary ground skills to prepare the aviators for instrument flight conditions. Any flight training that occurred during this period focused on developing proficiency for individual flying skills and for aircrew in-flight coordination. When meteorological conditions improved during the spring and summer months, the emphasis of the prescribed training syllabus shifted to more large-unit combat training. Between May and October, the airmen participated in exercises and maneuvers with other Air Force units and in joint exercises with the Army and the Navy. Despite this logical and well thought out training plan, the Air Staff still had trouble producing a consistent level of proficiency among the crews of the regular Air Force.

MANAGING THE SCHOOL SYSTEM

The Air Staff established optimistic production goals for the various schools in the training system. Students who entered the service through direct recruitment to receive flight training underwent a three-year training program while maintenance specialists graduated from the basic Mechanic's course after two years. In 1937, there were 748 students in various stages of training in the Salon-de-Provence Region. That same year an additional 210 students attended various courses that ranged from two weeks to five and a half months. Similar numbers of students attended courses administered in other regional training centers.³⁰

³⁰ S.H.A.A., Série 2B, Carton 12, "L'État-Major de l'Armée de l'Air à Monsieur le Général Commandant l'École de l'Air: Effectifs approximatifs des elements de l'École de l'Air stationnées dans la region de Salon," partial date, Feb 1937.

As tensions in Europe mounted, the leaders of the air service responded by creating more schools to handle anticipated service expansion. Many of the new schools received minimum staffing billets along with the minimum essential infrastructure and support required to manage the training programs the Air Staff charged them to execute. For example, Pierre Cot addressed a secret memorandum to the Regional Air Commanders informing them of his decision to create a new *Centre-École* at Salon in June of 1937. The Commandant of the school at Istres, near Marseille, received the additional responsibility of commanding the new school at Salon. For specific administrative support, the new school became dependent on “une Compagnie de ‘Air rattachée au Bataillon de l’Air N°125.”³¹ The impression is one of an organization created on paper without the personnel or the resources needed to accomplish the assigned training mission.

The situation of the school for mechanics at Strasbourg closely resembled that of the school at Salon. The Air Staff memorandum, dated 30 November 1937, informed the Commanding General of the First Air Region that a new school for mechanics would activate on 15 December—only two weeks from the date of the memorandum. In this case, the Air Staff specified the number and skill categories of the personnel who would man the school. Administrative support, like the school at Salon, came from an existing *Bataillon de l’Air*. This time, however, the Air Staff provided eleven additional personnel billets for the *Bataillon* to help handle the increased workload. Additionally, the memorandum clearly identified the composition of the school staff. Fifty-one

³¹ S.H.A.A., Série 2B, Carton 12, Ministère de l’Air, État-Major de l’Armée de l’Air, 1^{ère} Bureau, “Constitution du Centre-École de Salon-de-Provence,” Message 569-1.0/RS/E.M.A.A., 29 June 1937.

permanent staff members made up the faculty and supporting specialists; only fifteen of this number, however, were qualified as instructors. The fifteen instructors were destined to teach a student contingent of 150.³²

Strasbourg proved to be located too close to German territory to function effectively as a center for air service instruction. Shortly after the date for the school's scheduled activation, the Minister for National Defense and War inquired regarding the security of the new school. The Air Staff reply emphasized the temporary character of the school. "I am honored to inform you that the constitution of this *Centre-École* fills urgent and temporary needs of the *Armée de l'Air*. It will be dissolved as soon as the shortage of mechanics in the *Armée de l'Air* is reduced."³³ The author of the reply went on to assure the Minister that the Air Force remained aware of the precarious position of the base at Strasbourg. In the event of an emergency, the resources at the new base would evacuate to an airfield near Saverne some thirty kilometers to the northwest of Strasbourg.³⁴

The Air Staff's tendency to create new schools to solve increasing personnel shortages intensified as threats to French security multiplied in the second half of the decade. Archival sources indicate the Air Staff ordered at least twelve new schools to

³² S.H.A.A., Série 2B, Carton 12, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Général Commandant la 1^{ère} Région Aérienne, Dijon, "Création du Centre-École provisoire N° 357 à Strasbourg," Message 1602-1.0-RC/E.M.A.A., 30 November 1937.

³³ S.H.A.A., Série 2B, Carton 12, Ministère de l'Air, État-Major de l'Armée de l'Air, Le Ministre de l'Air à Monsieur le Ministre de la Défense Nationale et de la Guerre, État-Major de l'Armée, 1^{ère} Bureau, Paris, "Occupation de la Base Aérienne de Strasbourg," 28 December 1937.

³⁴ Ibid.

form between 1937 and 1940.³⁵ But the increase in facilities did not adequately address the shortages in critical specialties. There were several reasons for this phenomenon. First, and most obvious, related to the availability of qualified instructor personnel. Second, the length of the various training courses meant that the air service would only reap returns on investments in new training facilities after two or three years of training at the new schools. Finally, the threat of war, real and perceived, prompted the Air Staff to direct changes intended to preserve the training system in the event of an enemy attack. These changes served as an additional weight on an already overloaded system; the effect was a further slowing of production—the opposite of the Air Staff's intent.

The necessity to have a cadre of competent instructors was, perhaps, the most critical element of the French training system. The Air Staff was slow, however, to detect the relationship between their desired student production levels and the shortage of instructor personnel. Moreover, the school system did not have a dedicated instructor school for pilots until the shortage of instructors had reached emergency proportions. An Air Staff note dated 8 September 1939 expressed concerns over the magnitude of the instructor shortage. "It seems essential in these conditions to create an instructor school (*une École de moniteurs*) which will provide all instruction for the cadre of instructors, following one proven method..."³⁶

The first step to correct the problem was to consolidate the available instructors at the schools and from the tactical units. On September 21, 1939, the Air Staff informed

³⁵ S.H.A.A., Série 2B, See memoranda on various bases in Cartons 11 and 12.

³⁶ S.H.A.A., Série 2B, Carton 10, État-Major de l'Armée de l'Air, 3^{ème} Bureau, "Note pur le Général Commandant en Chef des Forces Aériennes," Message 238-3.1/E.M.A.A., 8 September 1939.

the commanders of the five air regions and the schools at Versailles, Bordeaux, d'Avord, and Etampes that a new school for instructor pilots would activate on 15 October at the Salon air base. The shortage was so acute, however, that the new school could not meet the immediate needs. Therefore, the commandants of the schools at Versailles and Bordeaux also received orders to institute training programs for instructors at their facilities. Further, the Air Staff directed each school to select twenty-five students to participate in the two and a half month training program. Thus, according to the production plan envisioned by this directive, the accelerated instructor pilot program could produce approximately 360 new instructor pilots per year.³⁷

The Air Staff devoted much of its attention to fine-tuning the school system to obtain the best results. The school and depot facilities at Istres illustrate the difficulty the leaders of the air service encountered in identifying the problems associated with training management and then devising valid solutions to those problems. In May 1937, the Air Staff issued a call for a review of operations at the depot that served the training school at Istres. The memorandum identified several factors that may have contributed to the inadequate support recently provided by the depot. All of the factors related to a recent reorganization of the school and an increase in the number of students in the flying training programs. The Air Staff tasked the Inspector General for Technical matters (*l'Inspection Général Technique*) to assess the facilities and the management at the depot

³⁷ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^{ème} Bureau, "École de Moniteurs de pilotage," Message 10,039-3/1/S/E.M.A.A., 21 September 1939.

to determine if the problem was one of poor management or one of lack of personnel.³⁸

At this point in the saga, the Air Staff was simply trying to understand the problem.

By August, the Air Staff had a clearer understanding of the sources of the problems at Istres. The increase in flying hours that stemmed from additional students in the training programs had certainly aggravated the stress on the workers at the depot. There were, however, three facts that were not included in the May memorandum. First, there was "an increase in the *Armée de l'Air* which [had] not seen a correspondingly equal increase in the assigned effectives [at Istres]."³⁹ Second, "the 40-hour law diminished the productivity of the civil personnel by 15%, with no corresponding augmentation of military personnel."⁴⁰ Finally, "there were a great number of multiplace airplanes placed in service at the Centre-École."⁴¹ The combined effects of these changes led the Air Staff to conclude, "The depot at Istres cannot function with the current personnel."⁴²

The Air Staff could not solve the critical shortage of civil and military workers at Istres by creating new schools. Moreover, the air service budget had no resources for hiring new civil personnel. According to the staff memo, "The Military Air Material Management [Directorate] has arrived at the limit of its budgetary resources for recruiting

³⁸ S.H.A.A., Série 2B, Carton 11, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Note pour l'Inspection Général Technique, "Parc d'Istres," Message 799-3/0/E.M.A.A., 15 May 1937.

³⁹ S.H.A.A., Série 2B, Carton 11, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Note pour le Chef d'État-Major de l'Armée de l'Air, "Parc d'Istres," Message 1170-3-1/0/E.M.A.A., 25 Aug 1937: 2.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

civil workers.”⁴³ There were, however, inefficiencies in the system—“excess [workers] in certain depots, in particular those at Lyon and Dijon”—that the staff could use to advantage in the effort to reverse the situation.⁴⁴ The distance between Istres and the two other depots presented new problems. Lyon was approximately 240 kilometers north of Istres and Dijon was almost twice that distance. Enticing civilian workers to make the move would take time and it would be difficult.

In order to prevent the problems at Istres from having further negative effects on the training mission, the Air Staff suggested some temporary solutions. First, the civil work force would gain fifty additional personnel (there was no Air Staff directive to explain how the depot at Istres would acquire these new workers). Second, the contracts for new maintenance hangars and repair facilities would proceed immediately to provide adequate facilities. Finally, a review of flying operations would reveal inefficiencies in the system. The optimistic view that the staff adopted held that once the training system began to operate more efficiently, all operations at the base would turn to a “more rational utilization of flying at the field.”⁴⁵ These suggestions did not address, however, the underlying causes of the maintenance, training, and flying problems at Istres.

Fourteen months later, operations at Istres had failed to improve; they had grown worse. The Air Staff characterized operations in October 1938 as “*la crise d’Istres*.”⁴⁶ By this point, the staff solutions to the crisis fell into one of three categories: “either a

⁴³ Ibid., 4.

⁴⁴ Ibid.

⁴⁵ Ibid., 7.

⁴⁶ S.H.A.A., Série 2B, Carton 11, Le 1^{ère} Bureau de l’État-Major de l’Armée de l’Air à Monsieur le Général Chef d’État-Major de l’Armée de l’Air, “Parc d’Istres,” Message number illegible, 7 October 1938: 1.

decrease in the workload; or an increase in [personnel] resources; or a compromise.”⁴⁷ None of the alternatives was attractive. Decreasing student output at the school meant delays in augmenting Air Force combat power. The staff recognized the import of this suggestion; student production was a function of “the needs of the Plan to increase [the strength] of the *Armée de l’Air*. Those needs are imperative; to reduce them would compromise the realization of the Plan.”⁴⁸ There was, however, a way around the tyranny of the student production goals at Istres. Istres functioned as a joint service training base where both Air Force and Naval aviators received flight training. The Air Staff acknowledged the legal obligation to provide training for Naval aviators, but noted in their memorandum, “It seems that the number of Navy students instructed each year at Istres is out of proportion to the importance of Naval Aeronautics.”⁴⁹ Therefore, the staff recommended a reduction in the number of naval aviation students along with the transfer of some specialized Air Force flight training to other bases with similar missions.

The structure of the flying training program appeared to have contributed to *la crise d’Istres* also. The staff study noted that between 1932 and 1938 the number of flying hours for student aircrews had increased from 125 to 240. This increase had “compromised the functioning of the *École* and had brought about the current crisis.”⁵⁰ The staff did not acknowledge, however, that increases in technological sophistication and mission complexity may have contributed to the increase in flying hour requirements.

⁴⁷ S.H.A.A., Série 2B, Carton 11, Le 1^{ère} Bureau de l’État-Major de l’Armée de l’Air à Monsieur le Général Chef d’État-Major de l’Armée de l’Air, “Parc d’Istres,” Message number illegible, 15 October 1938: 2.

⁴⁸ Ibid., 2.

⁴⁹ Ibid., 2.

⁵⁰ Ibid., 3.

The recommendation called for a comprehensive review of the training program to identify inefficiencies and to eliminate wasted flying hours that contributed to the maintenance workload.

Adding military maintenance personnel to the work force according to the second alternative suggested by the Air Staff appeared nearly impossible. The staff assessment of the work force at Istres revealed a twenty percent shortage of qualified non-commissioned officer mechanics. The problem was that the only way to overcome such a shortage in military personnel was to pull them from operational units. The Air Staff was unwilling to push this point, noting, "Such augmentation of the effectives would be made at the detriment of the combat formations which are already deficient and would risk compromising the functioning of those units."⁵¹ In the final analysis, the Air Staff could only suggest temporary measures to solve the crisis at the southern training base. The real solution to the problem would come only after the Air Force training system could produce enough qualified mechanics to fill the requirements at Istres and the other training bases. The situation was destined, however, to continue for another eleven months before the Air Minister acted to relieve the pressure on the training base and depot at Istres.

In October 1939, the Air Ministry began to take action to repair a training system that had proven inadequate for its assigned task. The situation at Istres prompted the Ministry to form a commission to look closely at the entire training system. The corrective actions that came from the commission's study would be a product of "the various inspections accomplished in the *Écoles* and instruction *Centres* for one part, and

⁵¹ Ibid., 4.

numerous conferences that [had] met relative to these same organizations for another part.”⁵² The Ministry optimistically declared that the solutions would address “all questions relative to their [the Écoles and Centres] functioning (Organization, Command, Student recruiting, Infrastructure, Material, etc.).”⁵³ The crisis at Istres that had developed over two years still required corrective action.

In November 1939, the Air Minister addressed a secret memorandum to the commander of the Fourth Air Region detailing his initiatives to ease the burden carried by the school and depot at Istres. After more than two years of temporary adjustments, study, and discussion, the Minister had decided “to reorganize the air base at Istres beginning on 1 December 1939 by reconstituting Air Battalion N° 125 and converting the existing depot and by creating on this base, in the conditions and on the date that you [the Air Region Commander] will ultimately establish, a Group of three pilot schools (*Écoles de pilotage*) which will be placed under the command of a superior officer, Commander of the Groupe d’Écoles and the Air Base.”⁵⁴ By this point the crisis at Istres had spread to encompass the *Armée de l’Air*’s entire training system. The leaders of the air service continued to focus on incremental stopgap measures. They chose to treat the symptoms rather than the underlying causes of the problems that plagued the training system. The

⁵² S.H.A.A., Série 2B, Carton 10, Ministère de l’Air note pour L’Inspection Générale des Écoles, L’État-Major de l’Armée de l’Air, La Direction du Contrôle, La Direction du Matériel Aérien Militaire, La Direction du Personnel Militaire, La Direction des Travaux et Installations, “Réorganisation des Écoles et Centres d’Instruction,” Message 885-S.1/1, 19 October 1939: 1.

⁵³ Ibid., 1.

⁵⁴ S.H.A.A., Série 2B, Carton 11, Ministère de l’Air, État-Major de l’Armée de l’Air, 1^{ère} Bureau, Le Ministre de l’Air à Monsieur le Général Commandant la 4^{ème} Région Aérienne, Aix-en-Provence, “Organisation de la Base-Groupe d’Écoles de pilotage d’Istres,” Message 919-1/1.S/E.M.A.A., 20 November 1939: 1.

Air Ministry asked the Air Staff to examine instructor and flight leader (*chef de patrouille*) manning levels at the schools with an eye toward "filling existing deficits, or in the expectation of relieving younger active [duty] officers currently functioning in these organizations."⁵⁵ In other words, the Air Minister suggested transferring active duty, and presumably, more qualified instructor pilots and flight leaders from the schools and replacing them with older reservists.

The pursuit aviation *Inspecteur et Commandant Supérieur*, Général d'Harcourt, informed the Air Force Chief of Staff that the Minister did not fully understand the problem. According to the General, the schools needed instructors, not flight leaders. To remove the young instructors from the school system in favor of older, less qualified reserve instructors would only exacerbate the problems that plagued the training system. Moreover, the pursuit schools charged with the mission of forming crew members and flight leaders needed a number of flight leader instructors who, according to d'Harcourt, were then available at flight training bases and other locations. The pursuit commander's assessment was that there remained an excess number of qualified flight leaders in the interior that could transfer to the faltering school system without necessitating the removal of the best instructors and flight leaders from either the schools or the combat units.⁵⁶

⁵⁵ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, Direction du Personnel Militaire, 1^{ère} Bureau, Echelon Lourd, Le Ministre de l'Air à Mr le Général Commandant en Chef les Forces Aériennes, "Demande de moniteurs officiers chefs de patrouille," Message 486-PM 1-2, 24 November 1939: 1.

⁵⁶ S.H.A.A., Série 2B, Carton 10, Commandement en Chef des Forces Aériennes, Inspection et Commandement Supérieure de l'Aviation de Chasse, Le Général de Corps Aérien d'Harcourt, Inspecteur et Commandant Supérieur de l'Aviation de Chasse à Monsieur le Général Commandant en Chef des Forces Aériennes (E.M.G.-1^o Bureau),

General d'Harcourt's advice apparently did not sway Air Force Chief of Staff, General Joseph Vuillemin. The Chief of Staff informed the Air Minister that it was impossible to transfer any instructors from the schools. It was equally impossible, according to Vuillemin, to "release personnel of the *Armées* to the benefit of the interior," and finally, "the release of *Officiers Instructeurs* and flight leader instructors at the schools and centers of instruction could be brought about, in principle, next spring..."⁵⁷ The Air Staff had once again failed to address adequately a critical systemic problem that held dramatic consequences for the effectiveness of French air power.

Late in 1939, the pressures of service expansion began to exert themselves on the entire training system. An inspection of the pursuit school (*Centre d'Instruction de Chasse*) at Montpellier, approximately 130 kilometers from Marseille, revealed the system's inability to provide the Air Force the critical numbers of pursuit pilots. General Vuillemin proposed augmenting the instructor cadres at the Montpellier and Chartres pursuit schools with instructors drawn from certain line units and from the instructor staff at the flight instructor school (*l'École de Formation des Moniteurs de Pilotage*).⁵⁸ Both solutions represented the worst of all possible alternatives. Removing experienced instructors from combat units deprived those units of the essential leadership required to

"Demande de moniteurs et Chefs de Patrouille pour les Écoles," Message 318 S/I.C., 3 December 1939: 1-2.

⁵⁷ S.H.A.A., Série 2B, Carton 10, Commandement en Chef des Forces Aériennes, État-Major Général, 1^{ère} Bureau, Le Général Commandant en Chef Vuillemin, Commandant en Chef les Forces Aériennes à Monsieur le Ministre de l'Air (Direction du Personnel Militaire), Message 1573-1/0.R.S./E.M.G., 14 December 1939: 1-2.

⁵⁸ S.H.A.A., Série 2B, Carton 10, Commandant en Chef des Forces Aériennes, État-Major Général, 3^{ème} Bureau, Le Général Commandant en Chef Vuillemin, Commandant en Chef des Forces Aériennes à Monsieur le Ministre de l'Air (E.M.A.A.—6^{ème} Bureau), "C.I.C. de Montpellier," Message 1435-3/1.S./E.M.G., 26 November 1939: 1-2.

prepare for their first operational encounters. Similarly, removing instructors from the instructor school guaranteed future shortages in the instructor force. Vuillemin's actions were analogous to a farmer feeding his seed corn to the livestock.⁵⁹ The animals may survive—in example of the Air Force case, the pursuit schools would function—but when spring planting time arrived there would be no seed to put in the ground. Moreover, in the context of French grand strategy that sought to draw Germany into a long war, the *Armée de l'Air*'s ability to produce instructors and pilots would become almost as important as halting the German offensives.⁶⁰

In January 1940, the Air Minister attempted once again to impose order and efficiency on the *Armée de l'Air*'s training system. The Minister settled on a new organizational scheme for the instructor pilot school at Salon. Under the new formula, the school would divide into two phases: "a division of instructors from the *École*

⁵⁹ Patrick Facon relates Anatole de Monzie's description of Vuillemin as a man ill suited for the position of Chief of Staff of the Air Force. He writes that Vuillemin acquired for the position because of his tendency to avoid conflict (*conformisme*) and for the weakness of his character. See Facon, *L'Armée de l'Air dans la tourmente*, 14. Arnaud Teyssier offers a more balanced assessment of Vuillemin's qualifications as the *Armée de l'Air*'s senior airman. See Arnaud Teyssier, "Le Général Vuillemin, Chef d'État-Major Général de l'Armée de l'Air (1938-1939): Un Haut Responsable Militaire Face au Danger Allemand," *Revue Historique des Armées* 2 (1987): 104-113.

⁶⁰ Ironically, the German Air Force encountered a similar dilemma late in the war when forced to decide between fighting current battles and preserving future combat capabilities. The Germans fared no better than had the French. Faced with increasing Allied air superiority, Generalleutnant Josef Schmid, commander of the Luftwaffe's I Fighter Corps, failed to devise a solution to wrest air superiority from the increasingly aggressive Allied fighter forces. "Schmid's biggest problem was one over which he had no control. During January, despite a heavy loss of pilots, he received no pilot replacements or reinforcements. German industry was sending him all the aircraft he could use, but the number of men he had to fly them continued to decline." See Stephen L. McFarland and Wesley Phillips Newton, *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944* (Washington: Smithsonian Institution Press, 1991): 160.

principale,” and another “division of instructors from the auxiliary and elementary school that will execute the elementary instructor’s course.”⁶¹ There was no explanation for the division of effort. The only rational reason for this change could be that the Air Minister perceived a different skill level required by the instructors operating at the different schools. By separating the skills and training objectives, he may have hoped to produce instructors for the various *écoles* faster than with a combined instructor school program. In any case, the January 1940 reorganization would not be the final word from the Air Ministry on the subject of training system organization.

In April 1940, the Air Minister focused his attention on the *Bases/Centres d’Instruction*. This time, the archival evidence permits insight into the rationale behind the Minister’s desire to change the training system. The essential problem was that multiple types of training activities occurred at a single base. The purpose of the new organization was to “concentrate the maximum available personnel and material at those *Bases/Centres d’Instruction* which are currently in the best position to give applied instruction.”⁶² This reform goal contains a telling critique of the training system. The statement amounts to a frank admission that the system operated in an inefficient manner.

⁶¹ S.H.A.A., Série 2B, Carton 12, État-Major de l’Armée de l’Air, 1^{ère} Bureau, Le Ministre de l’Air à Monsieur le Général Commandant la 4^{ème} Région Aérienne, Aix-en-Provence, Message 069-1/1.S./E.M.A.A., 8 January 1940: 1-2.

⁶² S.H.A.A., Série 2B, Carton 10, Ministère de l’Air, État-Major de l’Armée de l’Air, 1^{ère} Bureau, Le Ministre de l’Air à MM. Le Général Commandant la 1^{ère} Région Aérienne (Dijon), Le Général Commandant la 2^{ème} Région Aérienne (Paris), Le Général Commandant la 3^{ème} Région Aérienne (Tours), Le Général Commandant la 4^{ème} Région Aérienne (Aix), Le Général Commandant la 5^{ème} Région Aérienne (Alger), “Réorganisation des Bases/Centres d’Instruction de renseignement et de bombardement,” Message 1025-1/1-S/E.M.A.A., 1 April 1940: 1-2.

The Air Ministry plan to reform the training system affected seven bases scattered throughout metropolitan France. The changes focused primarily on consolidating training mission assignments to reduce the redundancy that had come to characterize the system. The obvious benefits that the Ministry expected to reap from the new organization stemmed from pooling the available instructor and maintenance resources at common locations rather than distributing the missions, personnel, and resources in small schools throughout the country.⁶³ Additionally, because of an influx of foreign students, mostly Poles and Czechs who were eager to continue the fight against German aggression, the French training system found itself flooded with students.⁶⁴ The Ministry intended for the new organizational framework to cope with this new student population by grouping nationalities at specific locations under the command of a French training cadre. Although the increase in combat pilots and ground specialists would prove useful when war broke out, the drain on French instructor resources added stress to a system that had already demonstrated significant flaws.

⁶³ Ibid., 2-7.

⁶⁴ See S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à MM. Le Général Commandant la 1^{ère} Région Aérienne (Dijon), le Le Général Commandant la 2^{ème} Région Aérienne (Paris), Le Général Commandant la 3^{ème} Région Aérienne (Tours), Le Général Commandant la 4^{ème} Région Aérienne (Aix), Le Général Commandant la 5^{ème} Région Aérienne (Alger), "Effectifs des formations de l'Intérieur," Message 1078-1/1-S./E.M.A.A., 4 April, 1940. Série 2B, Carton 11, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Général Commandant la 3^{ème} Région Aérienne—Tours, "Création de la Base/Centre d'Instruction de Cognac," Message 1154-1/1-S/E.M.A.A., 12 April 1940. Série 2B, Carton 12, Note pour l'État-Major de l'Armée de l'Air—4^{ème} Bureau, "Groupement École de l'Armée Polonaise," Message number illegible, 22 April 1940. Série 2B, Carton 12, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, "Tableaux d'Effectifs de la Base/École auxiliaire de Pilotage de l'Aviation Polonaise à Saint-Étienne," Message 1743-1/1-S/E.M.A.A., 11 May 1940.

The only solution to the critical shortage of instructor pilots that plagued the French training system was to draw upon the instructors that formed the core of experienced flyers in the combat units. Consequently, the Air Staff issued directions for instructors in certain specialties to report for duty at the *Centres d'Instruction*. The directive specified that instructors selected for this duty "would be detached [from their units] for a duration of six months, then reassigned to their original unit."⁶⁵ More importantly, the Air Staff specified that instructors chosen to serve in this capacity would "be chosen with a preference for those pilots who have already participated in combat to allow the students to benefit from their experience."⁶⁶ With less than one month before Germany was destined to invade French soil, the Air Staff decided to strip the frontline units of their most experienced combat veterans to place them in the schools.

PRESERVING THE TRAINING SYSTEM

As war with Germany and Italy became a reality, the Air Staff began to formulate plans for preserving the training system. This proved to be a difficult task because of the threat posed by enemy aviation. There were few bases in metropolitan France that remained secure from aerial attack. By the spring of 1940, the effects of the *drôle de guerre*, the phony war, had already disrupted the training routines at several bases. For example, the Air Staff modified the airspace available for the *Centre d'Instruction* at

⁶⁵ S.H.A.A., Série 2B, Carton 10, Commandement en Chef des Forces Aériennes, 3^e Bureau, Note de Service, "Désignations d'Instructeurs pour les Centres d'Instruction de Chasse," Message 2704-3/1.S./E.M.G., 19 April 1940: 1-2.

⁶⁶ Ibid.

Clermont-Ferrand to accommodate increased lookout (*ligne de guet*) operations.⁶⁷ In a more serious incident that occurred after the German offensives began, the bases at d'Avord and Chateauroux came under air attack prompting an inquest into the "dispersal of personnel without orders."⁶⁸ The war disrupted training operations at the *Centre d'Instruction* at Chartres so much that the Air Staff ordered the *Escadre d'Instruction de Chasse* at that base to relocate to Cazaux.⁶⁹ The Air Staff directed the *Centres d'Instruction de Bombardement* at Toulouse and Chateauroux to turn over their modern airplanes for use in combat operations. The Air Staff replaced the equipment losses at these two bases with *matériels anciens*.⁷⁰ Finally, extremely low altitude flights (*vols rasants*) at the Chateauroux base interfered with D.A.T. operations prompting the Air Staff to push the training zones and emergency landing fields further to the west to avoid friendly fire incidents.⁷¹ The heightened tensions and outright hostilities that

⁶⁷ S.H.A.A., Série 2B, Carton 11, Commandant en Chef des Forces Aériennes, État-Major Général, 3^o Bureau, Le Général Commandant en Chef Vuillemin, Commandant en Chef des Forces Aériennes à Monsieur le Ministre de l'Air, État-Major de l'Armée de l'Air, 3^o Bureau, "Zone d'Instruction du C.I. de Clermont-Ferrand," Message 2974-3.O.2/S/E.M.G., 28 April 1940: 1-2.

⁶⁸ S.H.A.A., Série 2B, Carton 11, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Général Inspecteur Général des Écoles et de Effectifs, "Tenue du Personnel pendant les attaques aériennes," Message 1570-1/1/S/E.M.A.A., 14 May 1940.

⁶⁹ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 6^o Bureau, "Fonctionnement des Centres d'Instruction de Chasse," Message 1080, 23 May 1940.

⁷⁰ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 6^{ème} Bureau, "Fonctionnement des Centres d'Instruction de Bombardement," Message 1082-6/2.S./E.M.A.A., 23 May 1940.

⁷¹ S.H.A.A., Série 2B, Carton 11, Commandement en Chef des Forces Aériennes, État-Major Général, 3^o Bureau, Le Général Commandant en Chef Vuillemin, Commandant en Chef des Forces Aériennes à Monsieur le Ministre de l'Air—E.M.A.A.—3^{ème} Bureau, "Zone d'Instruction de Chateauroux," Message 3746-3/O.2.S./E.M.G., 31 May 1940.

characterized the *drôle de guerre* and the early weeks of combat operations placed severe constraints on the training system's ability to produce combat-ready aircrew members. The Air Staff frantically sought alternatives that promised to preserve the training system while simultaneously increasing student production goals—two seemingly incompatible objectives.

Air Force leaders proposed the French territories in North Africa as a logical sanctuary for the training system. A system of bases in Tunisia, Algeria, and Morocco would provide the security and airspace necessary to produce combat ready aircrew members. Unfortunately for the *Armée de l'Air*, the reactive posture in the Air Ministry and the Air Staff resulted in delays in the planning process for creating the necessary infrastructure to allow the move to North Africa. The first indication that the Air Minister, Guy La Chambre, planned to move elements of the training system across the Mediterranean came in mid-October 1939. The *drôle de guerre* had already assumed its surreal characteristics⁷² and the training system showed signs of buckling under the strain of increased wartime requirements. The Air Minister's plan called for the creation of ten pilot schools, one observer school, and one combined gunnery-radio operator school.⁷³

⁷² See Weber, *The Hollow Years*, 257-272. Robert J. Young, *France and the Coming of the Second World War* (New York: St. Martin's Press, 1996): 130-148. William L. Shirer, *The Collapse of the Third Republic: An Inquiry into the Fall of France in 1940* (New York: Simon and Schuster, 1969): 519-560. Pierre Boillot, "La 'Drôle de guerre' et la Bataille de France Vues par un Sergeant Pilote," *Revue Historique des Armées* 2 (1986): 76-90.

⁷³ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Général Commandant en Chef les Forces Aériennes (État-Major Général—1^{ère} Bureau), Grand Quartier Général Aérien, "Écoles en Afrique du Nord," Message 454-1/1.S./E.M.A.A., 13 October 1939: 2.

La Chambre's overly optimistic program contained an added level of complexity—it concealed a reorganization of the established training system as well as the move to North Africa. The functions of the *écoles élémentaires*, *écoles auxiliaires*, and *écoles principales* would merge into a single school under the North Africa plan. To further complicate matters, the Air Minister's program called for each pilot school to receive fifty student pilots each month for a dramatically reduced pilot training syllabus. Rather than the three-year program that the system had followed in peacetime, La Chambre ordered the duration of the flight training cut to six months. Thus, according to the Air Minister's calculations, each North African school could accommodate 600 students per year. This impressive projection, however, did not take into account the duration of the new six-month curriculum. Although the schools could theoretically accept fifty students each month, the duration of the training program restricted the production of each school to 300 students per year. Yet, even with these optimistic figures, the creation of a completely new training system would take time. La Chambre's guidance for implementing the program called for two schools to begin operating in December 1939 with the remaining eight schools to receive their first student pilots by April 1940.⁷⁴ Therefore, the first 100 pilots to receive their certificates as graduates of the new *école principale* would not depart the North African training system for specialized combat training until June 1940; the first full contingent of students from all ten schools in the new system would not graduate until October of that year.

The unrealistic figures for student pilot production contained in the Air Minister's North Africa plan carried over into other specialties. According to the plan, the school

⁷⁴ Ibid., 2.

for observers planned *en principe* at Oran, Algeria “could produce 200 students every three months in the beginning.”⁷⁵ The combined gunnery and radio operator school also planned *en principe* to activate at Casablanca “could produce 200 gunners and 150 radio operators every three months.”⁷⁶ The Air Minister had made the mistake of forecasting student production figures for these schools before obtaining a final decision from the Air Staff on the provisioning and location of the facilities.

As the leaders of the *Armée de l’Air* planned the move to North Africa, they encountered the same problems that had plagued the training system since 1937. A fully functioning training system depended on “quality instructors, basic, transition, and advanced trainer aircraft, and sufficient stocks of equipment for the observers and gunners.”⁷⁷ The pressures of war had intensified the shortages of these critical resources for the training bases in metropolitan France. The Air Minister commented, “Henceforth, it seems that the resources at my disposal will be very insufficient...”⁷⁸ The only remedy for the shortages in personnel was to transfer the qualified instructors from the currently functioning training bases in France to the newly operating locations in North Africa. The movement of an entire training system would take time—more time than envisioned in the Air Minister’s proposal.

The North Africa solution was the only choice that promised to preserve the *Armée de l’Air*’s ability to reinforce the combat units as the war progressed. The movement across the Mediterranean was not without risks. Italian air and sea forces

⁷⁵ Ibid., 2.

⁷⁶ Ibid., 2.

⁷⁷ Ibid., 3.

⁷⁸ Ibid., 3.

threatened French shipping and flights destined for North Africa. Furthermore, Spanish intentions in the conflict were not clear. These considerations prompted General Vuillemin to approve La Chambre's proposal with the understanding that the new training system would not adversely affect operations at the North African air bases charged with preserving French security and freedom of action in the Mediterranean.⁷⁹

Vuillemin's concern for the operational units resulted in a review of the proposed training system in North Africa by the Fifth Air Region commander at Oran. The conclusion forwarded to the Air Ministry caused a change in the plans to move the schools. Rather than adapting existing bases in Algeria to the training mission, the new plan called for the "majority of the projected schools to be installed in Morocco."⁸⁰ This adjustment reduced the projected capacity of each school from 600 students per year to 450 students per year. The infrastructure decisions also caused delays in activating the new schools. Those schools originally scheduled to open in December 1939 could not begin receiving students until January 1940, and those scheduled to open in April 1940 were delayed until May.⁸¹ Despite the ambitious scope of the North Africa school plan, it did not replace the existing schools in France. The size of the training system coupled

⁷⁹ S.H.A.A., Série 2B, Carton 10, Commandement en Chef des Forces Aériennes, État-Major Général, 3^o Bureau, Le Général Commandant en Chef Vuillemin, Commandant en Chef des Forces Aériennes à Monsieur le Ministre de l'Air, État-Major de l'Armée de l'Air (1^o Bureau), "Écoles en Afrique du Nord," Message 582-3/1./S./E.M.A.A., 16 Octobre 1939.

⁸⁰ S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^{ème} Bureau, Le Ministre de l'Air à Monsieur le Général Commandant en Chef les Forces Aériennes (État-Major Général—3^o Bureau), "Écoles en Afrique du Nord," Message 89-3/1.S./E.M.A.A., 7 November 1939: 2.

⁸¹ Ibid., 4.

with the logistics requirements that accompanied the task of administering technical and flying training programs precluded a complete transfer of the missions to North Africa.

By the spring of 1940, the Air Staff found itself in the unenviable position of having to attempt the impossible. The war threatened the vital training bases in southeastern France. La Chambre ordered the leaders of the *Armée de l'Air* to develop plans for moving nine schools from seven bases in the areas under the greatest threat. The Air Minister directed the staff to examine possible evacuation sites in the interior of metropolitan France, but the logical choices for the most critical bases (Istres and Salon) were unspecified locations in North Africa. Istres was an especially important facility; it contained three *écoles principales* (two bombardment schools and one reconnaissance school) with an enrollment of 760 student pilots. The potential disruption of the training program that an evacuation could cause threatened to halt student production for more than three months. La Chambre advised a wait-and-see attitude; rather than urging the Air Staff to begin the moves immediately, he ordered careful studies of the potential reception sites with an eye toward beginning the moves in the summer. The catalyst for the evacuations would be Italy's initiation of hostilities in southeastern France. Once more, the leaders of the French Air Force surrendered the initiative in favor of reacting to events that promised to shatter their vital training system.⁸²

By May 1940, the leisurely approach that had characterized French preparations to preserve the training system during the *drôle de guerre* began to cost the service dearly. On the 17th, the Air Ministry ordered the Fifth Air Region commander in Algeria

⁸² S.H.A.A., Série 2B, Carton 10, Ministère de l'Air, État-Major de l'Armée de l'Air, Cabinet, Le Ministre de l'Air à M. le Général Commandant en Chef des Forces Aériennes, Message 112/E.M.A.A./Cab., 25 April 1940.

to establish a new pursuit school at Oran.⁸³ Four days later, on 21 May, the Ministry ordered the pilot training schools at Istres to begin evacuation to North Africa.⁸⁴ On 1 June, the Intelligence School (*Centre d'Instruction de Renseignement*) at Tours, including the schools at Clermont-Ferrand and Rennes, was to cease training operations and evacuate to *Afrique du Nord*. Those students who completed enough of the training program to remain in France and participate in the nation's defense would receive assignments to operational units.⁸⁵ Finally, the instructors at the schools at Versailles received orders to depart for Rabat, Morocco.⁸⁶ By failing to act to preserve the training before their enemies launched their attacks, French air leaders deprived their nation of a reliable source of qualified replacement aircrew members and maintenance specialists. If the *Armée de l'Air* was responsible for the defeat in 1940, the failure of the Air Ministry and the Air Staff to act decisively to preserve the system contributed to the weakness of the air service's response to German air and land attacks.

⁸³ S.H.A.A., Série 2B, Carton 12, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Général Commandant la 5^{ème} Région Aérienne—Alger, "Création de la Base-Centre d'Instruction de Chasse d'Oran," Message 1707-1/1-S/E.M.A.A., 17 May 1940.

⁸⁴ S.H.A.A., Série 2B, Carton 11, Ministère de l'Air, État-Major de l'Armée de l'Air, 1^o Bureau, Le Ministre de l'Air à MM. Le Général Commandant la 4^{ème} Région Aérienne, Aix-en-Provence, le Général Commandant la 5^{ème} Région Aérienne, Alger, "Repli Base/Groupe d'Écoles d'Istres," Message 1779-1/1-S/E.M.A.A., 21 May 1940.

⁸⁵ S.H.A.A., Série 2B, Carton 12, État-Major de l'Armée de l'Air, 6^o Bureau, Le Ministre de l'Air à M. le Général Commandant la 3^o Région Aérienne—Tours, "Repli du Centre d'Instruction de Renseignement de Tours en Afrique du Nord," Message 1149-6/2.S/E.M.A.A., 1 June 1940.

⁸⁶ S.H.A.A., Série 2B, Carton 12, État-Major de l'Armée de l'Air, 1^{ère} Bureau, Le Ministre de l'Air à Monsieur le Ministre de la Défense Nationale et de la Guerre, État-Major de l'Armée—1^{ère} Bureau, "Envoi à Rabat des instructeurs militaires du département de la Guerre détachés à la Base/Groupe d'Écoles de l'Air de Versailles," Message 2036-1/1S/E.M.A.A., 1 June 1940.

The training system that the *Armée de l'Air* used in the 1930s had the potential to produce adequate numbers of qualified aircrew members and support personnel. Tragically, it failed to fulfill its potential because the Air Staff's sluggish response to several challenges—the shortage of instructors and trained personnel, inefficient training system management, and the lack of adequate stocks of material—left the training system at the mercy of increasing demands to produce students and instructors. Doctrine provided a logical and carefully constructed structure to guide the programs at the various training schools and operational units. The leaders on the Air Staff had no difficulty identifying the problems that plagued the training system. The case of the school and depot at Istres illustrates that the airmen in Paris identified the critical elements of the problems that plagued training operations at that base. The leaders of the *Armée de l'Air* failed to take timely, decisive action to eliminate redundancy and inefficiencies in the system. The result was a training system that, like the Air Force it served, drifted from crisis to crisis until the tragedy of the war caused the entire façade to come crashing down.

CHAPTER 5

MANEUVERS, EXERCISES, AND REACTIVE DOCTRINE

These exercises have shown the perfect adaptation of the current organization to the needs of the modern battle...¹

The regular schedule of maneuvers and exercises that occurred between 1933 and 1940 did more to reinforce the *Armée de l'Air*'s reactive doctrine than any other institutional mechanism. The *Armée de l'Air* used maneuvers and exercises to refine operational and tactical mission capabilities, to experiment with new force employment concepts and technologies,² and to resolve differing conceptions of roles and missions. Rather than acting as laboratories for innovation, however, the various maneuvers that the leaders of the *Armée de l'Air* designed and implemented during the 1930s pushed the air

¹ S.H.A.A., Série 2B, Carton 116, Ministère de l'Air, Le Ministre de l'Air à M. le Général Commandant la 1^{ère} Région Aérienne—Dijon; M. le Général Commandant la 2^{ème} Région Aérienne—Paris; M. le Général Commandant la 3^{ème} Région Aérienne—Tours; M. le Général Commandant la 4^{ème} Région Aérienne—Aix-en-Provence; M. le Général Commandant la 5^{ème} Région Aérienne—Alger, "Ordre du Jour," Message 8843-C.M., 27 August 1937: 1.

² Another institutional vehicle the *Armée de l'Air* used to develop new operational and tactical concepts was the *Centre d'Experiences Aériennes Militaires* where service personnel studied specific problems for the Air Ministry and Air Staff. Examples of topics that occupied the *Centre*'s attention included railway attack, dive bombing procedures, bombardment attacks against hardened bunkers, and aerial attacks against armored forces. See S.H.A.A., Série 2B, Cartons 110-111.

service away from a vision of modern war based upon an all-encompassing *lutte aérienne* toward roles for air power that left the service virtually incapable of independent action and highly vulnerable to new concepts of modern warfare. The tragedy did not lie in the fact that this deterioration of service autonomy happened; the tragedy was that the leaders of the *Armée de l'Air* failed to defend a comprehensive vision of modern aerial warfare. In other words, air service leaders became willing participants with the Army, the Navy, and the government in the process of stripping their service of its independence.³

The archival evidence that forms the basis for an analysis of the *Armée de l'Air*'s maneuver and exercise record in the 1930s left an incomplete trail in the interwar period. The surviving records consist of Air Ministry and Air Staff planning documents and after-action reports. Often these documents refer to more than one exercise in each year, but the records documenting smaller scale exercises disappeared. Additionally, the details of how each exercise unfolded—the on-scene umpire's reports—did not survive. The resulting historical record became a rather sterile version of Air Staff conclusions about the various exercises and maneuvers. Nevertheless, the questions that staff members posed and the ways they interpreted exercise results provide valuable insight into institutional attitudes toward specific operational, tactical, and doctrinal problems.

³ Pascal Vennesson argues that institutional factors contributed significantly to the erosion of Air Force autonomy. He writes, "In France...air power was regarded as a continuation of existing weapon systems, particularly of the cavalry's reconnaissance missions and long rang artillery. The attack on the economic potential of the enemy never fully convinced either army officers, or *airmen*." [italics added] See Pascal Vennesson, "Institution and Airpower: The Making of the French Air Force," *The Journal of Strategic Studies* 18 (1995): 37. See also: Pascal Vennesson, *Les Chevaliers de l'Air: Aviation et conflits au XX^e siècle* (Paris: Presses de Sciences Po & Fondation Pour les Études de Défense, 1997).

The level of detail that came to characterize the planning orders for each maneuver and exercise communicated the degree of importance that service leaders attached to these events. The surviving planning packages and exercise critiques reveal how the exercises and maneuvers of the 1930s contributed to the French reactive approach to air power doctrine. The degree of continuity or change reflected in scenario development from year to year offered clues regarding the degree of operational and tactical maturity in the air service. Air Staff attempts—or lack thereof—to anticipate conditions of modern aerial warfare show how the service matched doctrinal concepts of *lutte aérienne* to simulated combat operations. In other words, the degree of realism and unrestrained simulated combat allowed in the maneuvers prepared airmen to fight a particular kind of war. This implies that the air service was ill prepared to fight other kinds of wars because they failed to anticipate alternatives to their own conceptions of aerial warfare. The important question to answer in this regard centers on how closely the maneuvers conformed to doctrinal precepts. Finally, the exercises and maneuvers contributed—for good or for ill—to doctrine development. If the maneuvers failed to reflect published doctrines, what messages did the lessons from the exercises send to service members, and what effect did those messages have on operational and tactical effectiveness? Ultimately, these three elements—scenario development, realistic exercise play, and the use of lessons from the exercises—had a dramatic effect on Air Force combat effectiveness in 1940.

SCENARIO DEVELOPMENT

French perceptions of German strategy coupled with their own grand strategic visions of a defensive war colored the scenarios created for every maneuver and exercise in which the *Armée de l'Air* participated during the 1930s.⁴ The pervasive influence of defensive strategies eroded the importance of offensive aerial warfare in the air service until the eve of the Second World War. But more importantly, the scenarios that air leaders developed relied upon French bombardment units to act as enemy infiltrators. By forcing the bombers to act as targets for French aerial defenses, the annual maneuvers exerted a subtle demoralizing effect among the *Armée de l'Air's* offensive strike forces. Thus, when war came in 1939, the French Air Force found itself caught in an operational and tactical trap of its own making.

Large-scale air maneuvers and exercises usually occurred during the late summer and early fall of each year. This conformed to the broad outlines of the flying training schedule described in the *Règlements de Manoeuvre de l'Aviation*.⁵ By staging the exercises in the fall each year, the various echelons that participated could concentrate on compiling their reports for the Air Staff during the winter months when ground training assumed a greater importance in the unit training schedules. The Air Staff issued

⁴ See Pierre Cot, *L'Armée de l'Air, 1936-1938* (Paris: Éditions Bernard Grasset, 1939). J. Néré, *The Foreign Policy of France from 1914 to 1945*, trans. Translance (London: Routledge and Keegan Paul, 1975). Robert A. Doughty, *The Seeds of Disaster: The Development of French Army Doctrine 1919-1939* (Hamden, CT: Archon Books, 1985).

⁵ S.H.A.A., Série 2B, Carton 109, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre de l'Aviation, (1^{ère}, 2^e, et 3^e Parties)* (Paris: Imprimerie Nationale, 1937): 34-44.

directives by late June or early July that provided the details of the scheduled maneuvers including dates, units tasked, scenario outlines, deployment schedules, funding authorizations, command assignments, and communications procedures.⁶ These directives contained scripts for every aspect of the exercise or maneuver and sought to eliminate any unplanned or unanticipated results.

Two elements comprised the scenario for each maneuver or exercise. The first element was a statement or a series of statements that described the particular operational or tactical problems that the Air Staff sought to study in the course of each exercise. These statements were usually broad declarations that introduced the problems; later in the staff package, or in other memoranda, the staff laid out the details of each problem. The second element of the scenario appeared under the heading *Thème Général*. Here the Staff described the political conditions that would lead to hostilities, the general disposition of combatant air forces, the geographic scope of the exercise, and the anticipated actions of the belligerents.

The 1^{ère} *Manoeuvre Combinée* that occurred in June 1933, barely five months after the government granted the service independent status, represented the earliest recorded maneuver for the independent *Armée de l'Air*. Although this exercise was relatively small in terms of the units employed, the problem that the Air Staff studied in 1933 would become a recurring feature of all the exercises and maneuvers for the remainder of the decade.⁷ The exercise sought to determine how French pursuit units

⁶ See various documents in S.H.A.A., Série 2B, Cartons 113, 114, 115, 116.

⁷ S.H.A.A., Série 2B, Carton 110, Inspection de l'Aviation Légère de Défense, "1^{ère} Manoeuvre Combinée (3^{ème} Régiment et 22^{ème} Escadre)," 3 July 1933.

could intercept enemy bombers before they reached their targets in French territory. The specific agenda for the 1933 maneuvers called for pursuit units to use a tactic described as *chasse à courre*, literally “to go hunting.” The limited numbers of available pursuit aircrews and airplanes assigned to *aviation légère de défense* near Army operational units along the front forced the airmen to devise a tactical method to help them cope with the demands for their services. The loose control offered by the *chasse à courre* tactic promised to allow air service commanders to organize the aerial resources assigned to cover the front in a more efficient manner. The *Inspection de l’Aviation Légère de Défense* staff concluded that pursuit units could use the new tactic to cover an area up to 300 kilometers behind the front lines with fighters based every 200 kilometers. The priority for each pursuit base was to intercept enemy bombers within the first 100 kilometers after they crossed French lines.⁸ This approach reflected a use for air power as airborne cavalry posted on the lookout for enemy penetrations. The geometric design of the *chasse à courre* intercept zones also conformed to land warfare schemes for maneuver; in other words, the airmen had not begun to think in terms of three-dimensional combat. Despite the mathematical precision with which the staff report defended the conclusions gleaned from the exercise, several flaws in the scenario invalidated the organization proposed by the inspectorate.

⁸ Ibid. The British developed radar as a technological solution to the problem of locating enemy formations. For a recent analysis of radar developments in the interwar period see Alan Beyerchen, “From Radio to Radar: Interwar military adaptation to technological change in Germany, the United Kingdom, and the United States,” in Williamson Murray and Allan R. Millett, eds. *Military Innovation in the Interwar Period* (Cambridge: Cambridge University Press, 1996): 265-299.

In the first place, the scenario forced bomber formations into the pursuit patrol zones. Bomber crews flew prescribed routes and altitudes without attempting evasive maneuvers. Therefore, the bomber aircrews in the 1933 maneuvers were not intelligent, thinking enemies; on the contrary, they were little more than target drones for the waiting pursuit attackers. To be fair to the *aviation légère de défense* staff, the report readily acknowledged this point by stating "it remains to be seen if the liaison with a control airplane and the assignment of pursuit units can occur in a reasonable time."⁹ In other words, the staff understood that pursuit units required some assistance in locating determined, creative bomber formations. The second major flaw in the 1933 scenario lay in the assumption that the pursuit units would have equal or superior speed and climb performance characteristics compared to the bomber formations they were to attack. Unlike the flawed assumption that bomber formations would fly passively into the pursuit intercept zones, the staff report did not appear to evaluate the implications for the scenario or operational concepts if either pursuit or bomber capabilities changed. In other words, the exercise failed to test the validity of either doctrine or tactics thus making it useful only as a vehicle for small unit training. Despite these serious defects in scenario design, the 1933 maneuvers gave the fledgling air service practical experience and confidence that would carry over into subsequent annual maneuvers and exercises.

Joint warfighting action with land forces characterized the scenario for the 1934 maneuvers. This scenario forced aviation units into a subordinate, defensive role alongside their Army counterparts. Air leaders focused on developing more efficient coordination procedures with land commanders. From the air service perspective,

⁹ Ibid., 1.

reconnaissance efforts, the principal mission that required interaction with land commanders, often yielded little useful information because land commanders were too directive and specific when they tasked reconnaissance aviation to search for enemy units. Aviation performed in this role much as it had in the context of World War I battles; there was little flexibility and initiative outside the scope of land operations. Or, as the exercise report indicated, "Instead of indicating the objective and allowing the aviator to conduct the search in an intelligent manner, the orders simply treat the airplane as a machine that goes 'to look at such a point,' to 'investigate such a route'...the aviator finds himself left with no initiative."¹⁰ This relationship evolved in this way, in part, because land commanders failed to understand how the perspective from the air changed reconnaissance missions; land commanders thought of reconnaissance aviation as little more than airborne cavalry.¹¹ The airmen believed that a more flexible tasking of air units would yield better information for their ground force counterparts while allowing a more efficient use of aerial resources.

A second element of the 1934 scenario concerned the proper role for the aviation commander in joint operations. Army commanders preferred to have the air commander at the headquarters at all times. This arrangement presented several problems of command and control from the air service perspective. *Armée de l'Air* command arrangements left very few field grade officers in the tactical units; Captains and

¹⁰ S.H.A.A., Série 2B, Carton 113, "Exercices de 1934," 10 July 1934: 3.

¹¹ "The result is that their orders use too much air power in secondary searches to the detriment of the essential searches and the observers do not receive the intellectual stimulation that allows them to accomplish their missions and to take the initiative." See *Ibid.*, 5.

Lieutenants led squadron-level formations. This meant that senior officers routinely spent time traveling between smaller units to check on operations, to give advice to junior officers, to pass on orders from the headquarters, and to fly with the units as the mission commander. Because leadership meant different things to officers in the two services, the air and land perspectives clashed with respect to the role performed by senior aviators during the course of a campaign. Senior Army leaders controlled the pace and scope of operations from their headquarters. The air service valued leaders who maintained a rapport with their men. The best air commanders, according to the Air Force perspective, shared the risks of aerial combat with their men. By forcing senior aviators to remain at Army headquarters, ground commanders isolated the airmen from the tactical and operational situation in the air, from their own aerial lines of communication, and from the logistics and support situation at their bases. Airmen hoped to use the 1934 maneuvers to demonstrate to Army commanders an alternative, more effective way to lead Air Force units in the context of joint operations.

By 1935, the scenario used in the fall maneuvers focused on a broad range of issues that pertained to unique aspects of air power employment. The 1935 maneuvers involved units of the regular Air Force and those of the *Défense Anti-Aérienne du Territoire* (D.A.T.). The D.A.T. organization served as the first line of aerial defense for the nation. D.A.T. units provided aerial security (*couverture*) for land and air forces during the mobilization and concentration phases of the early days of a war. Additionally, the D.A.T. directorate coordinated with the War Ministry for anti-aircraft defenses, with the Ministry of the Interior for passive (civil) defense, and with the

Ministry of Posts, Telephone, and Telegraph to communicate alerts within the system.¹² D.A.T. units provided a critical element in the detection and notification of air attacks against military as well as towns and vital industrial areas to pursuit units, anti-aircraft artillery batteries, and civil defense organizations. As the regular units of the *Armée de l'Air* moved from their mobilization centers to concentration and employment bases they reinforced D.A.T. forces. Therefore, the 1935 maneuvers examined two critical problems for the *Armée de l'Air*. First, the Air Staff was interested in how D.A.T. units, including alerting networks (*réseau de guet*) and pursuit aviation (*aviation légère de défense*), performed in the early phases of a conflict. The second question that helped to shape the 1935 scenario centered on how regular Air Force units integrated with the D.A.T. system in the context of an on-going theater-level war.¹³ Once again, however, the air service had focused exclusively on defensive operations for the largest exercise that would occur in 1935. Offensive aviation units, under the command of future Chief of Staff General Vuillemin, found themselves arrayed against larger numbers of defending pursuit units under the combined D.A.T.—Air Force structure.

The records for the 1935 maneuvers offer the first opportunity to study the *Thème Général* for a major air exercise. The pattern established in this exercise provided the

¹² Charles Christienne and Pierre Lissarrague, *A History of French Military Aviation*, trans. Francis Kianka (Washington, D. C.: Smithsonian Institution Press, 1986); originally published as *Histoire de l'Aviation Militaire Française* (Paris: Charles-Lavauzelle, 1980): 310.

¹³ S.H.A.A., Série 2B, Carton 113, Ministère de l'Air, État-Major Général de l'Armée de l'Air, 3^e Section, Le Ministre de l'Air à MM. le Général Commandant la 1^{re} Région Aérienne—Metz, le Général Commandant la 2^e Région Aérienne—Paris, le Général Commandant la 3^e Région Aérienne—Tours, le Général Commandant la 4^e Région Aérienne—Lyon, "Manoeuvres AIR-D.A.T., 1935," Message 653-3.R/E.M.G., 27 June 1935: 1-2.

basis for the political and geographic characteristics for most of the exercises for the remainder of the decade. The scenario described two combatant nations: one nation was the aggressor while the other shunned all thoughts of offensive maneuver or territorial aggrandizement until the aggressive enemy began a full-scale retreat. The geographic characteristics of the exercise concentrated land and air units of Blue Forces (*un état bleu*) along a common border while Red Forces (*un état rouge*) waited on the defensive in anticipation of an unprovoked attack by the Blue enemy.¹⁴

The operational objectives of the Blue force commander read like a page from German plans in 1914. "The intention of the government is to attack the Red country using a surprise attack with the maximum force in order to obtain a rapid decision in the West and to be more capable of acting on its eastern frontiers."¹⁵ The action envisioned by Blue air forces proved as unconventional as the overall strategy was conventional. "The Air Forces will seek, in a *massive attack*, launched at the opening of hostilities, to strike the morale of the Red nation, to diminish its war potential, and to disrupt the concentration of its armies."¹⁶ In this vision of aerial warfare, the French attempted to apply the full range of air power effects including offensive attacks against operational centers of gravity. Ironically, however, the *Armée de l'Air* was on the receiving end of the strategic, operational, and morale assaults delivered by the Blue air forces.

¹⁴ S.H.A.A., Série 2B, Carton 113, Exercices d'Application de l'Aviation de Défense, 1935, Parti de l'Attaque, Pièce N° 1, "Thème Général," n.d.: 1.

¹⁵ S.H.A.A., Série 2B, Carton 113, Manoeuvres Air-D.A.T. 1935, Direction, 28 Septembre—8 heures, Parti Bleu, Pièce N° 2, "Décision du Gouvernement Bleu," 1.

¹⁶ Ibid., [emphasis in original].

The 1935 exercise area covered the northern heartland of metropolitan France. Blue forces operated east of a line that stretched from Montmedy, just north of Verdun, to the Moselle River, south of Nancy. Red forces defended a vast area west of that line including the Channel coast from Cherbourg to Dieppe. Although Paris served as an acknowledged vital political, military, and industrial centers, the Air Staff elected to make the city off-limits in the scenario.¹⁷ The *Armée de l'Air* concentrated on defending the nation against a surprise aerial attack that targeted the entire spectrum of civil and military targets. The scenario called for the maneuvers to last five days from 30 September until 4 October. On the first day, D.A.T. forces provided the necessary cover for air and land forces to move from their mobilization centers to join the battle. By the second day of the exercise, regular *Armée de l'Air* units bolstered the D.A.T. defenses, and by day three, the *Armée de l'Air* carried the brunt of the air war for the Red forces. The Air Staff called for operations on the first two days to occur in daylight only; days three and four involved simulated combat operations during night and day. Red forces used the final night of the exercise to experiment with night intercept operations near Reims, approximately 100 kilometers northeast of Paris. Additional operational exercises included in the scenario involved Red forces tasked to defend coastal areas against possible Blue attacks. On the surface, this scenario provided a vehicle for realizing the

¹⁷ S.H.A.A., Série 2B, Carton 113, Ministère de l'Air, État-Major Général de l'Armée de l'Air, 3^e Section, Le Ministre de l'Air à MM. le Général Commandant la 1^{re} Région Aérienne—Metz, le Général Commandant la 2^e Région Aérienne—Paris, le Général Commandant la 3^e Région Aérienne—Tours, le Général Commandant la 4^e Région Aérienne—Lyon, "Manoeuvres AIR-D.A.T., 1935," Message 653-3.R/E.M.G., 27 June 1935: 3-4.

potential of the *lutte aérienne*, but it failed to recognize the full range of air power options.

The 1935 maneuvers represented the air service's most ambitious attempt to date to evaluate its doctrine and its capability to defend the nation's vital centers against aerial attack. This exercise scenario, for the first time, paid homage, in a conceptual way, to the full scope of aerial warfare. One of the exercise objectives identified in the Air Staff scenario included an evaluation of the *Armée de l'Air's* ability to strike targets deep in enemy territory.¹⁸ This served as little more than window dressing that did not detract, however, from the defensive operations that made up most of the exercise objectives. The Red Forces, representing France, had no long-range aviation component; thus, there was no way for friendly forces to achieve the offensive exercise objectives. The Air Staff had assigned its most up-to-date pursuit units to the defensive role. Fourteen groups flying a mix of Morane 225 and Dewoitine 500 pursuit aircraft challenged eleven Blue bombardment groups flying obsolete (*ancien*) Léo 20, aging (*transition*) Léo 206, and modern Bloch 200 and Amiot 143 bombers. The fighters outclassed the bombers in every performance category with the Dewoitine 500 and Morane 225 enjoying a thirty percent advantage in speed and a staggering sixty percent advantage in operating ceiling capability over the bombers.¹⁹ One of the distressing conclusions from this comparison

¹⁸ Ibid., 1.

¹⁹ In the United States, the U. S. Army Air Corps reached the opposite conclusion concerning comparisons of fighter and bomber performance. Air Corps leaders believed that the multi-engine bomber would outclass single-engine pursuit planes. General Oscar Westover commented, "Since new bombardment aircraft possesses [sic] speed above two hundred miles per hour, any intercepting or supporting aircraft must possess greater speed characteristics if they are to perform their missions. In the case of pursuit aviation, this increase of speed must be so great as to make it doubtful whether pursuit aircraft can

of fighter and bomber performance was the obvious failure of the B.C.R. procurement initiative.²⁰ This stressed an assumption that remained typical of every aerial exercise of the 1930s. French airmen assumed that opposing forces would attempt to defeat their defenses by applying similar technologies and doctrines. Despite the Blue Forces' material disadvantage, the opportunity to plan and execute offensive aerial operations kept the vision of the *lutte aérienne* alive.

In 1936, the fall maneuvers strengthened the trend toward improving operations between D.A.T. and the regular units of the *Armée de l'Air*. The political and operational scenario fell into the well-established pattern of French forces, represented by the *parti rouge*, attempting to halt an unprovoked attack from the east by the *parti bleu*. The 1936 scenario differed from that of earlier maneuvers in its emphasis on studying the operations of alert and communications networks. If the maneuvers of the previous three years had indicated the Air Staff's concern for defensive air operations, to the point of

be efficiently or safely operated either individually or in mass." See Wesley Frank Craven and James Lea Cate, eds. *The Army Air Forces in World War II, Volume One: Plans and Early Operations, January 1939 to August 1942* (Chicago: The University of Chicago Press, 1948; reprint, Washington, D.C.: Office of Air Force History, 1983): 65. For performance characteristics see S.H.A.A., Série 2B, Carton 113, Ministère de l'Air, État-Major Général de l'Armée de l'Air, 3^e Section, Le Ministre de l'Air à MM. le Général Commandant la 1^{re} Région Aérienne—Metz, le Général Commandant la 2^{de} Région Aérienne—Paris, le Général Commandant la 3^{de} Région Aérienne—Tours, le Général Commandant la 4^{de} Région Aérienne—Lyon, "Manoeuvres AIR-D.A.T., 1935," Message 653-3.R/E.M.G., 27 June 1935: Annexe III. See also, H.R.A. file 248.211-26A, "Comparison of World Powers Aircraft/Engines," 15 January 1938.

²⁰ The Bloch 200 and Amiot 143 were both products of the B.C.R. procurement program. The Amiot was France's most modern bomber in 1935. It continued in the inventory until the disastrous campaign of 1940 when the French used it in a ground attack role against German infantry and tank formations where its poor performance characteristics made it an easy target for German fighters and anti-aircraft artillery. See Christienne and Lissarrague, *A History of French Military Aviation*, 259-265, 345-363.

excluding nearly all other aspects of air power employment, the 1936 emphasis on communications and alerting procedures made the maneuvers appear more like a ground exercise than one focused on employing air power. Twenty of the thirty pages that comprised the scenario instructions for the Red forces, the *dossier rouge*, outlined the communications procedures for the six-day maneuvers.²¹

The significant reduction in the air forces scheduled to participate in the 1936 maneuvers represented another, even more ominous, change for French offensive air power. Although the basic scenario objective remained similar to the offensive objective of the previous year's maneuvers, "to conduct attacks against sensitive points and air bases in enemy territory," a subtle change occurred.²² The scenario directed Blue Force bombardment units to assign priority to attacks against enemy air bases. The vision of an air war that only one year earlier described air power's ability to reach deep into enemy territory to strike the political, industrial, morale, and military centers of gravity now contracted considerably. Blue bombers restricted their actions to the enemy air forces, followed by attacks against mobilization centers and rail networks that supplied men and material to the Red Army stationed along the common frontier. Moreover, the scope of the air forces that participated in the exercise decreased significantly; the 1935 maneuvers saw twenty-five pursuit and bomber groups arrayed against each other. In 1936, Red forces consisted of four pursuit groups while the Air Staff allocated Blue forces only

²¹ S.H.A.A., Série 2B, Carton 114, Exercice Principal de D.A.T. 1936, "Dossier du Parti Rouge," n.d.

²² S.H.A.A., Série 2B, Carton 114, Exercice Principal de D.A.T. 1936, "Dossier Général: Piece N° 1," n.d.: 3.

three bomber groups.²³ With this drastic reduction in aviation resources, follow-on attacks against mobilization centers and rail networks by Blue Force bombers could not threaten the functioning of either target system—if they occurred at all. The largest combat maneuver for the year became a staff exercise rather than a laboratory for improving aerial combat effectiveness.

A second exercise in 1936 stressed logistics support for air operations in the context of simulated combat conditions. The *Exercice technique de l'Armée de l'Air*, scheduled to occur between 7 and 12 September, focused on the relationship between logistics doctrine (*l'Instruction provisoire sur le Service de l'Air*) and mobilization procedures. Air service leaders recognized that an air war presented different logistics problems than those found in land and naval warfare. Achieving and measuring combat effectiveness hinged, in part, on the *Armée de l'Air's* ability to sustain its operational forces in the increased pace of wartime operations. Therefore, the *exercice technique* tested the mobilization, supply, and armaments components of the logistics system under the watchful eye of General Paul Armengaud, former 37th Aviation Regiment Commander in Morocco, now a member of the *Conseil Supérieur de l'Air* and *Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles*.²⁴

²³ S.H.A.A., Série 2B, Carton 114, Exercice Principal de D.A.T. 1936, "Dossier du Parti Rouge: Piece N° 4," n.d. S.H.A.A., Série 2B, Carton 114, Exercice Principal de D.A.T. 1936, "Dossier du Parti Bleu: Piece N° 4," n.d.

²⁴ S.H.A.A., Série 2B, Carton 115, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^e Section, Le Ministre de l'Air à MM. le Général Commandant la 1^{re} Région Aérienne—Metz; le Général Commandant la 2^e Région Aérienne—Paris; le Général Commandant la 3^e Région Aérienne—Tours, "Organisation de l'Exercice Technique de l'Armée de l'Air," Message 471-3.R/E.M.A.A., 13 May 1936: 1-8.

Armengaud directed the units tasked to participate in the exercise to begin reviewing the applicable regulations. On 7 August, one month before the scheduled starting date for the exercise, he also ordered flying units to begin practicing for simulated combat operations. He urged logistics personnel to pay particular attention to resupply procedures during mobilization when units moved from their mobilization centers to their initial concentration bases. The key, according to Armengaud, was for the crews to “study the best solutions for obtaining the maximum speed” in generating combat sorties.²⁵ In other words, Armengaud predicted that the Air Force that could generate and sustain the most combat sorties would develop a decisive edge over a slower opponent. This approach encouraged the *Armée de l’Air* to focus on tracking missions flown rather than upon devising procedures for effective targeting.

Night operations presented problems that caused Air Force leaders to include a significant objective for take-off, landing, refueling, and rearmament at night in the 1936 *exercice technique*. Night operations were not as much of a concern at established air bases; during wartime, and especially during the hectic mobilization phase of the early days of a conflict, air service personnel could expect to operate from unimproved fields with poor lighting and few navigation aids. Armengaud developed part of his scenario to test aircrew skills in night “takeoff and landing using only aircraft lighting...”²⁶

²⁵ S.H.A.A., Série 2B, Carton 115, Le Général de Division Armengaud, Membre du Conseil Supérieure de l’Air, Inspecteur de l’Aviation de Défense Métropolitaine et des Écoles à MM. le Général Commandant la 1^o Région Aérienne—Metz; le Général Commandant la 2^o Région Aérienne—Paris; le Général Commandant la 3^o Région Aérienne—Tours, “Exercice Technique 1936: Préparation de l’Aviation Lourde de Défense,” Message 61/2-S./I.A.D.M.E., 7 August 1936: 1.

²⁶ Ibid., 3.

Additionally, combat operations against a robust enemy air force would result in battle damage to some French aircraft. The *exercice technique* tasked logistics commanders to establish emergency airfields to assist those aviators “who find themselves in difficulty during the mission.”²⁷ Finally, Armengaud planned to experiment with offensive air power tactics during the week-long exercise. He understood the importance of the rail system to French (and German) mobilization plans. Therefore, Armengaud tasked bombardment units (*aviation lourde de défense*) to study typical railway components to determine how best to inflict “important cuts” on the system. The epitome of skill in railway attack operations was to “find the points that are the most vulnerable and the easiest to attack.”²⁸

Although Armengaud’s *exercice technique* was a poor reflection of the regular fall maneuvers, it highlighted some serious challenges for the *Armée de l’Air*’s future combat potential. The stress that accompanied conditions that approximated combat operations caused severe fatigue among aircrews and maintenance personnel alike. The exercise report identified the following problems that related to fatigue and stress:

The numerous hours of alert and waiting imposed upon all personnel, 9 to 10 hours each day on average from Monday to Saturday the 12th, ...often resulted in the absolute impossibility of obtaining suitable meals and rest rendering the situation of the standby and alert pilots impossible...all the personnel of the 1st Group were perpetually in alert status. It is necessary to add that two missions per day and even three, as occurred on Saturday the 12th, resulted in overwork and extreme fatigue. Four pilots of the Group exhibited particularly grave signs of intense fatigue and one of those four was sent for medical treatment.

The essential functioning of the Group was only assured on the last day by two remaining officers (the Group Commander and the

²⁷ Ibid.

²⁸ Ibid., 4.

Communications Officer) in the most deplorable conditions and without the slightest possibility of food from 0900 until 1800.²⁹

The stoic qualities of French airmen clearly allowed them to rise to the occasion, but just barely. The lessons for actual combat conditions appeared evident for those who wished to acknowledge them. The line between success and failure in support functions could be very thin; thus, the 1936 exercise season rendered valuable data for the leaders of the *Armée de l'Air*.

The 1937 maneuvers marked a departure from the predominantly defensive exercises that characterized the *Armée de l'Air*'s first three years. The scenario goals expressed a greatly expanded purpose for the exercise compared to the anemic goals expressed in the 1936 maneuvers. The Air Staff directive that announced the exercise schedule stated that the goal was "to study, in the current organizational cadre of the *Armée de l'Air*, the conditions for employing, to the greatest possible extent, the *Grandes Unités Aériennes* in offensive and defensive situations."³⁰ The acknowledgment of offensive and defensive possibilities for air power represented an expansion of the doctrinal possibilities for French aviation. The defensive objectives that dominated earlier exercises and maneuvers remained a fixture in the 1937 scenario, but offensive operations opened new possibilities for the *parti rouge*. Bombardment operations were not restricted to daylight hours, but if French forces were to develop proficiency in both day and night bombing strikes, the airmen would have to experiment with various

²⁹ S.H.A.A., Série 2B, Carton 115, "Compte-Rendu sur l'Exercice de Deplacement Technique de l'Armée de l'Air," 15 September 1936: 6.

³⁰ S.H.A.A., Série 2B, Carton 116, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^o Bureau, "Instruction Fixant les Conditions Générales d'Organisation des 'Grandes Manoeuvres Aériennes' de 1937," Message 988-3-1.S./E.M.A.A., 10 May 1937: 2

formation configurations, dawn and dusk attacks, and night navigation procedures to ensure the bombers arrived at their assigned targets.³¹

The enhanced character of the air service as an autonomous force represented another interesting feature of the 1937 scenario. For the first time the Air Staff used the term *Grandes Unités Aériennes* to describe the air forces that participated in the exercise. The new organization of offensive striking power into a *Grande Unité Aérienne* unified the various categories of French air power. In previous exercises, the division of air units according to mission—pursuit, bombardment, reconnaissance, transport, and liaison—had fragmented the roles and missions of the air service and had diluted its combat effectiveness. In 1937, the *parti rouge*, under the command of General Vuillemin, gathered the various types of aircraft under a single commander who organized his forces according to campaign and mission objectives.³² This was a new packaging of air power that lent credibility to the possibilities of using aviation as a dominant, if not the dominant, striking force. This development was not surprising when considered in light of the offensive goals the Air Staff had routinely assigned to the *parti bleu* in earlier maneuvers. It appeared, by 1937, that French air leaders realized the potential advantages available to an Air Force that pursued offensive and defensive goals simultaneously.

Operational and tactical innovation also marked the scenario goals for 1937. The

³¹ Ibid., 4.

³² S.H.A.A., Série 2B, Carton 116, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^e Bureau, "Instruction Fixant les Conditions d'Organisation des 'Grandes Manoeuvres Aériennes' Particulières aux Éléments de l'Armée de l'Air—Annexe N° 1," Message 1418-3-1.S./E.M.A.A., 28 June 1937.

Air Staff used the standard political scenario, adjusted geographically to southeastern France to include a larger maritime aspect, to allow the offensive components of French aviation to attempt the disruption of enemy command and control, supplies, and second echelon forces. Although largely restricted to attacks against the enemy army, this vision of aerial action represented a significant innovation compared to the purely defensive maneuvers of earlier scenarios. But the Air Staff went further to include "an experimental combined action (pursuit, bombers, paratroops) against the rear areas of a land force."³³ The French paratroops, *l'Infanterie de l'Air*, represented an elite strike force within the air service designed for three basic types of missions: "demolition, cover for an aerial landing, or cover for a terrestrial approach."³⁴ The 1937 maneuvers witnessed the debut of a new striking arm for the air service.

The 1937 maneuvers demonstrated that the *Armée de l'Air* had the conceptual potential to design operations that could influence the direction of theater-level war efforts. In 1938, the emphasis shifted back to defensive warfare. D.A.T. and Army maneuvers scheduled for August of that year emphasized the necessity of halting a massive enemy air and ground assault. The *Thème Général* included a political twist that had not appeared in previous scenarios. The combatant nations still shared a common border, but in the 1938 scenario, several neutral states bounded the northern zone of the exercise area. Additionally, the scenario departed from the standard designation of the

³³ S.H.A.A., Série 2B, Carton 116, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^e Bureau, "Instruction Fixant les Conditions Générales d'Organisation des 'Grandes Manoeuvres Aériennes' de 1937," Message 988-3-1.S./E.M.A.A., 10 May 1937: 5.

³⁴ S.H.A.A., Série 2B, Carton 109, Ministère de l'Air, État-Major de l'Armée de l'Air, *Règlement de Manoeuvre, Livre V: L'Infanterie de l'Air* (Paris: Imprimerie Nationale, 1938): 7.

defensive nation as the *parti rouge* and the aggressive nation as the *parti bleu*. The Staff directed the *parti rouge*, now the enemy nation, to assemble air and land forces east of a line bounded by the towns of Metz, Verdun, Bar-le-Duc, Chaumont, Belfort, and Sarrebourg. The Red forces covered their assault on the Blue defenders by staging combined air and land maneuvers. War would come unexpectedly without an official declaration from the Red government.³⁵

The operational scenario for the Blue (defensive) air forces clearly retained some emphasis on offensive operations that had characterized the 1937 maneuvers, despite the overall defensive nature planned for the exercise in 1938. The D.A.T. forces received the mission of providing security for the land and air forces as they mobilized and maneuvered into contact with the advancing enemy. This represented the normal role performed by the D.A.T. organization since 1933. The regular *Armée de l'Air* forces were to assume the offensive immediately—a departure from the standard formula in which the *Armée de l'Air* joined D.A.T. forces to reinforce the defensive effort. The primary mission for the *Armée de l'Air* was “offensive operations, led by bombardment aviation, initially seeking those objectives identified in peacetime with an eye toward attacking the essential sensitive points of enemy aerial and terrestrial maneuver.”³⁶ Thus

³⁵ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, “Dossier Général, Pièce N° 3: Thème Général,” n.d.: 1-2.

³⁶ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, “Dossier Du Parti Bleu, Pièce N° 3,” n.d.: 1. The *Armée de l'Air* focused on operational centers of gravity—primarily enemy air forces and land components—while the British and American versions of air power targeted strategic centers of gravity, the vital centers of the enemy nation. For an analysis of American perspectives see Lt. Col. Peter R. Faber, “Interwar U. S. Army Aviation and the Air Corps Tactical School: Incubators of American Airpower,” in Col. Philip Meilinger, ed. *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AFB, AL: Air University Press, 1997): 183-238. For the

the autonomous action envisioned in the *Grande Unité Aérienne* organizational structure allowed Air Force units to restore offensive striking power to French air power operational concepts while D.A.T. continued to satisfy the Army's demands for *couverture* and reconnaissance aviation.

The possibility that enemy forces would be capable of launching a surprise attack with fully mobilized forces caused the scenario authors to include a larger mobilization and logistics component in the 1938 maneuvers. This concern was also a product of problems identified with the mobilization and logistics systems in earlier exercises. Mobilization procedures focused on developing proficiency among the staff units tasked with processing the large numbers of reservists who would flood the mobilization centers when the government placed the nation on a war footing. Additionally, the Air Staff planned to exercise the air and rail transportation system to evaluate the system's ability to move personnel and material from mobilization centers to operating areas.³⁷

Air power figured significantly in the logistics component of the exercise. The Air Staff hoped to experiment with "the rapid resupply of the formations of the *Armée de l'Air*."³⁸ The experiment called for placing obsolete LEO 20 biplane bombers at the disposal of the supply depots for aerial transport of critical spare parts. Converted to a transport role, the LEO 20 could deliver spare parts and limited quantities of fuel to

evolution of British and American bombing doctrine see Tami Davis Biddle, "Rhetoric and Reality in Air Warfare: The evolution of British and American Ideas About Strategic Bombing," (Ph.D. diss., Yale University, 1995).

³⁷ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, "Instruction Particulière sur la Concentration du Parti Bleu," n.d.: 1-8.

³⁸ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, Dossier du Parti Bleu, Pièce N° 7, "Instruction Particulière sur la mise en oeuvre d'un Dispositif pour le Ravitaillement Rapide des Formations de l'Armée de l'Air," n.d.: 1.

operating bases closer to the front. This experimental rapid resupply system depended on reliable communications between the supply depots, headquarters, and the operational units. The Air Staff directed two communications units to support the logistics experiment. The headquarters staff would collect requests for material from the operational units and coordinate with the supply commanders to fill the requests. A special communications code established for the resupply experiment ensured that the communications network did not suffer an overload.³⁹

A final innovation established in the 1938 scenario involved the use of a radar-like system (*détection électromagnétique*) to detect enemy aircraft. The new technology promised to enhance the efficiency of D.A.T. pursuit and anti-aircraft units. The plan called for a double line of radar transmitter-receiver pairs. Overlapping coverage zones for the transmitter-receiver posts allowed technicians to obtain two independent sources of aircraft course and speed. A central alerting post collected the data and notified anti-aircraft batteries or pursuit units within the overall D.A.T. system by telephone.⁴⁰

The 1938 maneuvers clearly represented the most mature and ambitious exercise the *Armée de l'Air* had planned since the service gained independence in 1933. Unfortunately, the airmen did not have an opportunity to benefit from the full range of activities planned for the exercise. On 19 July 1938, only one week before the scheduled

³⁹ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, Dossier du Parti Bleu, Pièce N° 7, "Instruction Particulière sur la mise en oeuvre d'un Dispositif pour le Ravitaillement Rapide des Formations de l'Armée de l'Air: Tableau 1," n.d.

⁴⁰ S.H.A.A., Série 2B, Carton 116, Manoeuvres de D.A.T. en 1938, Dossier du Parti Bleu, Pièce N° 11, "Instruction Particulière pour les Éléments de Détection Électromagnétique et pour les P.C. de Batteries qui Travaillent en Liaison," n.d.: 1-10, Annexe I-II.

start date for the exercise, the Air Minister informed the participants "The President of the Council, Minister of National Defense and of War has decided that the D.A.T. maneuvers will not be carried out."⁴¹ Although the Defense Ministry had cancelled the full range of maneuvers, the Air Ministry elected to continue with certain aspects of the maneuver. Personnel in the reserves who had received orders to participate in the exercise continued to their assigned billets while the D.A.T. passive defense exercises envisioned in the scenario proceeded as planned along with regularly scheduled D.A.T. training schedules. Certain support units, particularly those that supported field units with communications, photographic services, and fuel fulfilled their normal support functions for those units on independent maneuvers.⁴² The air service lost, however, its last, and perhaps its best, opportunity to prepare for a war against a modern air and land power. After 1938, the exercise pattern reverted to the fragmented application of air power that prevailed before the 1937 maneuvers. The *Armée de l'Air* abandoned the offensive strategies that showed potential in 1937 and in the aborted exercise scenario in 1938.

The way that the exercise scenarios of the 1930s evolved in sophistication and

⁴¹ S.H.A.A., Série 2B, Carton 116, Ministère de l'Air, État-Major de l'Armée de l'Air, 3^o Bureau, Le Ministre de l'Air à M. le Général Inspecteur Général de la Défense Aérienne et Inspecteur de la Défense Antiaérienne du Territoire, Membre du Conseil Supérieur de l'Air; M. le Général Commandant la 1^{ère} Région Aérienne—Dijon; M. le Général Commandant la 2^{ème} Région Aérienne—Paris; M. le Général Commandant la 3^{ème} Région Aérienne—Tours; M. le Général Commandant la 4^{ème} Région Aérienne—Aix-en-Provence; M. le Général Commandant la 1^{ère} Corps Aérien—Paris; M. le Général Commandant la 2^{ème} Corps Aérien—Reims; M. le Général Commandant l'École de l'Air, Membre du Conseil Supérieur de l'Air—Paris, "Manoeuvres de D.A.T. en 1938," Message 1596-3-1-S/E.M.A.A., 29 July 1938: 2.

⁴² Ibid., 2-4.

detail reveals that the leaders of the *Armée de l'Air* considered a full spectrum of air power missions. However, several tendencies emerged: a desire to subordinate air power resources to ground maneuver elements, a willingness to "rig" the outcome of the exercises, and the seemingly inescapable tendency to conceive of air power as another ground reserve. In spite of these tendencies, the steady increase in complexity demonstrated a level of creativity and innovation not normally credited to the French airmen. What the scenarios do not reveal, however, is the degree of realism that the airmen experienced during the course of the exercises and maneuvers. If the exercises conformed rigidly to the script established in the various *Thèmes Générales*, the Air Staff only reinforced institutional policies. If, on the other hand, the scenarios represented a departure point from which airmen could explore the possibilities for air power employment, the various maneuvers filled a vital institutional role in the process of developing French air power theory and doctrine.

REALISM IN EXERCISES AND MANEUVERS

The progress of scenario development for air service maneuvers and exercises followed a path of increasing complexity and sophistication. Air service leaders gradually pushed the boundaries of air power employment away from the limited, cooperative roles that were the legacy of the World War I battlefield. The scenarios also pushed the limits of air power beyond the purely defensive strategies that dominated Army employment concepts. By 1937, the leaders of the *Armée de l'Air* had successfully incorporated elements of the unified air battle, *lutte aérienne*, into the scenarios for the

annual maneuvers. Scenario design was, however, only one element of the process. An analysis of how the exercises and maneuvers of the 1930s influenced French air doctrine would be incomplete without an examination of the relationships between the scenario objectives and the execution of the missions outlined in each scheduled maneuver. As the airmen reviewed the scenarios and their own performance in the maneuvers and exercises, they provided valuable information for refining their doctrines.

One of the continuing problems the Air Staff after-action reports identified as a result of the annual exercises related to the lack of proficiency among Air Force personnel as they performed their assigned duties. In an indirect way, this contributed to a lack of realism in the execution of the exercises and maneuvers. The emphasis on providing basic proficiency training rather than on rehearsing for operational uses of air power corrupted exercise objectives. The staff assessments of various exercises highlighted this systemic problem in nearly every exercise, for nearly every military specialty, throughout the 1930s. The combined maneuvers for 1934 revealed "the necessity of developing tactical awareness among [aircrew] observers...by making them participate regularly in [map and field] exercises with Army units (*Grandes Unités terrestres*)..."⁴³ In 1935, the lack of familiarity with aircraft radio equipment and communication security procedures resulted in a flight commander transmitting a message that could have compromised his mission.⁴⁴ During a 1936 exercise, a bomber

⁴³ S.H.A.A., Série 2B, Carton 113, "Exercices de 1934: Remarques Concernant l'Aviation," 10 July 1934: 12.

⁴⁴ S.H.A.A., Série 2B, Carton 117, "Exercices d'Application d'Aviation de Défense, 1935," 2 November 1935: 7.

formation made an unscheduled landing because the fuel load planned for the mission was insufficient.⁴⁵

Air service personnel assigned to support specialties on the ground performed as poorly as some of their aviator brethren did. General Armengaud observed that the 1935 maneuvers highlighted "the importance of frequent training for personnel of the General Security Service..."⁴⁶ One officer reported training related problems encountered in a heavy equipment company during an exercise, but the officer in charge was not to blame. The reporting officer noted,

The faults committed [by the Company Commander] do not seem to stem from a lack of zeal on his part and I believe they are excusable in part for the following reasons: he was designated to take command of the Company only at the last minute—replacing a Reserve Officer who had proved unsatisfactory. He assumed his position with extremely vague notions of his role and almost no information about the exercise.⁴⁷

Therefore, considering these examples of poorly trained personnel, the first assessment of the degree of realism in the French exercise and maneuver schedule leads to a condemnation of the unit proficiency training programs. To be sure, the same results caused by poorly trained personnel would have produced unsatisfactory results in

⁴⁵ S.H.A.A., Série 2B, Carton 115, "Compte-Rendu sur l'Exercice de Deplacement Technique du l'Armée de l'Air," 15 September 1936: 5.

⁴⁶ S.H.A.A., Série 2B, Carton 114, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles, État-Major, Le Général de Division Armengaud, Membre du Conseil Supérieur de l'Air, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles à Monsieur le Ministre de l'Air, État-Major Général de l'Armée de l'Air, 3^{ème} Section, "Manoeuvres Air-D.A.T. en 1936," Message 23/1/I.A.D.M.E. 14 January 1936: 3.

⁴⁷ S.H.A.A., Série 2B, Carton 115, Exercice Technique de l'Armée de l'Air, Parti Bleu, Secteur d'Opérations Aériennes N° 2, Le Colonel LeBlanc, Commandant le Secteur d'Opérations Aériennes N° 2 à Monsieur le Général de Division, Directeur de l'Exercice, "Au sujet de fautes commises au cours de l'exercice à Luxeuil," Message 667/S.B.C., 17 September 1936: 2.

combat. In this sense, the sorry state of the *Armée de l'Air*'s proficiency training translated into realistic exercise performance. In another sense, however, the consistently poor performance by airmen and ground support personnel lent an unrealistic character to the exercises that diverted attention from the Air Staff's stated objectives and led to erroneous conclusions. In other words, at times the inadequate performance by the aircrews and ground personnel who manned the tactical units prevented the Air Staff from realizing the goals of the various maneuvers. But the lack of realism was not always the fault of the airmen and ground technicians—often the Air Staff manipulated conditions within the exercise resulting in less realistic operating conditions.

French economic conditions brought on by the worldwide economic crisis often prompted the Air Staff to accept less realistic conditions in the implementation of exercises in the 1930s. When compelled to limit the forces or conditions of a particular maneuver or exercise because of economic constraints the Air Staff often rendered an honest assessment of how the absence of the resources affected the outcome of the exercise. For example, in the 1934 maneuvers, the fiscal situation precluded full use of pursuit aviation. One consequence of this situation was that reconnaissance units ranged along the Army lines without the normal pursuit escorts. This limitation also applied to the enemy forces thus allowing friendly reconnaissance aircraft to loiter in their search areas for longer periods. The obvious result was that the information obtained by the observers was of a very high quality. The exercise evaluators emphasized the importance of explaining the constraints that a realistic air war would impose upon reconnaissance

units. Their concern was that ground commanders would become dependent on rapid, easily obtained aerial reconnaissance and photographic support.⁴⁸

Perhaps the most counter-productive constraint that the Air Staff placed upon the exercises involved intentionally unrealistic procedures. When this occurred, the officers tasked to evaluate the exercises openly criticized the results. In the 1935 air defense exercises, General d'Harcourt noted "The operations envisaged for the attacking force directed a one-hour flight over obligatory checkpoints...the initiative of the mission commanders was singularly reduced because of these directives."⁴⁹ General Armengaud echoed d'Harcourt's criticisms. He commented on the meticulous preparations by pursuit units that preceded the 1935 maneuvers; the result was a mechanical presentation of the pursuit portion of the exercise. In Armengaud's opinion, "pursuit aviation was [for all purposes] only represented by the command airplanes."⁵⁰ According to the *Armée de l'Air's* own senior officers, the rigid controls placed on the air forces that participated in the exercises threatened to degrade the already questionable capabilities of the air service's combat units.

On a more positive note, the Air Staff's repeated attempts to impose rigid controls on the exercises and maneuvers often revealed the folly of such policies. As the

⁴⁸ S.H.A.A., Série 2B, Carton 113, "Exercices de 1934: Remarques Concernant l'Aviation," 10 July 1934: 13.

⁴⁹ S.H.A.A., Série 2B, Carton 113, Général d'Harcourt, "Rapport sur le Contrôle et l'Observation de l'Exécution des Exercices," 2 November 1935: 4

⁵⁰ S.H.A.A., Série 2B, Carton 114, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles, État-Major, Le Général de Division Armengaud, Membre du Conseil Supérieur de l'Air, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles à Monsieur le Ministre de l'Air, État-Major Général de l'Armée de l'Air, 3^{ème} Section, "Manoeuvres Air-D.A.T. en 1936," Message 23/1/I.A.D.M.E. 14 January 1936: 2.

scenarios unfolded, the airmen began to experience the complex realities of modern air war. And in doing so, they gained proficiency and confidence in performing their assigned tasks. One report noted, "If the experience [using aircraft without radios for pursuit intercepts] failed from a tactical point of view, it was by contrast a success from a technical point of view."⁵¹ Because air service personnel did not have the required levels of proficiency before participating in the exercises, however, they robbed their service of valuable opportunities to test doctrine and force employment concepts.

The alerting network (*reseau de guet*), a key component of the D.A.T. system, handled large volumes of messages. The exercise reports identified a recurring trend in the processing of the various types of messages that coursed through the network. Invariably, during the first day of each exercise the communications components of the D.A.T. system processed messages very slowly; by the end of the scheduled exercise activities, however, communications technicians adapted to the pace of the simulated combat operations. In the critical areas of communications and warning procedures, the flow of information between alerting outposts and the various intermediate and higher headquarters represented one of the most important measures of effectiveness for the Air Staff.

As early as the 1934 maneuvers, air leaders realized the importance of improving the communication system on the ground and in the air. Abuses of the communications network disrupted the aerial reconnaissance effort and caused some reconnaissance crews

⁵¹ S.H.A.A., Série 2B, Carton 113, Exercice d'Application de l'Aviation de Défense, "Rapport sur le Contrôle et l'Observation de l'Execution des Exercices," 2 November 1935: 21.

to land before completing their assigned missions.⁵² The 1935 maneuvers revealed delays in transmitting information about enemy overflights of lookout posts to higher headquarters that ranged from ten to seventeen minutes. Once the messages reached the headquarters, however, the dispatch of pursuit units to intercept the incoming enemy formations required from fifty-four minutes to and interminable one hour and twenty-seven minutes.⁵³

In the 1937 *Grandes Manoeuvres Aériennes*, the communications network handled 6,526 messages during the first three days of the exercise. The average elapsed time required to notify the higher headquarters that enemy aircraft had penetrated the frontier dropped dramatically from six and a half minutes on the first day to one minute and forty-five seconds on the third day. The intercept time dropped correspondingly from an average of twenty-one minutes on the first day to approximately six minutes by the third day of the exercise.⁵⁴ This dramatic improvement demonstrated the validity of the exercise as a training tool. Unfortunately, the Air Staff did not establish training objectives for the exercises and maneuvers. Air Force leaders intended the exercises as opportunities to assess operational and tactical employment concepts.

Thus, several competing trends influenced the degree of realism that the *Armée de l'Air* could impart to the scenarios for the exercises and maneuvers during the 1930s. Economic constraints limited the number and types of forces used in the exercises. A

⁵² S.H.A.A., Série 2B, Carton 113, "Exercices de 1934: Remarques Concernant l'Aviation," 10 July 1934: 6.

⁵³ S.H.A.A., Série 2B, Carton 117, "Exercices d'Application d'Aviation de Défense, 1935," 2 November 1935: 58-60.

⁵⁴ S.H.A.A., Série 2B, Carton 115, "Rapport Relatif à la Manoeuvre 'Air-D.A.T.' de la 2^e Région Aérienne (18 Juin-1^{er} Juillet 1937)," n.a., n.d.: 10.

specific script—using well-rehearsed plans or failing to allow unrestrained combat simulation—directed by the Air Staff emphasized certain aspects of air power employment at the expense of others. This tended to make the exercise resemble a play rather than an operational wargame focused on employing air power. Finally, the low level of combat readiness on the part of Air Force personnel exerted the most damaging effect on the *Armée de l’Air*’s exercise initiatives. Although this last trend diluted the intended purpose of the activities, it also gave Air Force leaders a valuable gauge against which they could measure the effectiveness of their training systems, the technical and tactical proficiency of their personnel, and the adequacy of their doctrine. The perceptive critiques provided by officers such as Generals Armengaud, d’Harcourt, and others revealed that service leaders were far from ignorant of the problems that plagued French air power. The final area to examine concerns how French airmen used the information gleaned from the exercises and maneuvers of the 1930s to refine their doctrine.

EXERCISES, MANEUVERS AND DOCTRINE

French airmen often made honest attempts to use service exercises as vehicles for refining doctrine. The consistent identification of experimental agenda in the exercise scenarios confirms this fact. Just as several trends placed constraints on achieving higher levels of realism, however, there were also trends that prevented service leaders from translating lessons from the exercises into doctrine. In some instances, the search for a more offensive role for air power, for example, the air service experienced limited successes. In others, a host of factors, including interservice rivalry, economic

constraints, technological development, and grand strategy, prevented a full implementation of doctrinal changes. Yet, the concerns expressed in the scenarios for the aerial maneuvers for the period reveal another clue to the multi-faceted nature of reactive air doctrine.

One of the most important doctrinal precepts that characterized the exercises of the 1930s concerned the command and control of aerial resources in the context of a theater-level war. This issue came to symbolize the struggle for service autonomy. Airmen had to choose either to allow land and sea commanders to define the scope and purpose of air service objectives, or to establish patterns for aerial operations that emphasized the ways that air power could achieve objectives independent of, or in concert with, the other services. Air service leaders argued that even when air power acted in support of land or naval forces, the most effective use of aviation lay in decentralizing mission taskings.⁵⁵

The law that established the air service compounded the confusion that surrounded command relationships. Certain Air Force units automatically came under the authority of Army or Navy commanders in time of war. The air commanders in these situations retained administrative authority over aviation assets, but the land or sea commanders exercised operational authority over the air units placed at their disposal. To complicate matters further, the *Armée de l'Air* created a wartime command structure separate from the peacetime *Régions Aériennes*.⁵⁶ General Armengaud used his critique of the 1935 maneuvers to comment on the dangers of this divided command structure.

⁵⁵ S.H.A.A., Série 2B, Carton 113, "Exercices de 1934: Remarques Concernant l'Aviation," 10 July 1934: 5-8.

⁵⁶ Christienne and Lissarague, *A History of French Military Aviation*, 253-259.

The Command of the *Armée de l'Air* in peacetime has the serious defect of being different from that in war. It is necessary, at the very least, to give the Commander of Aerial Defense and each of his two assistants (Heavy and Light Aviation) the opportunity, through the preparation and execution of a general maneuver, to assume command of the units which will come under his authority in the event of hostilities. It is only in this way that these general officers and their staffs can train for the tasks that will befall them on Day J [the initiation of hostilities] when they will be called upon to assume their duties rapidly...⁵⁷

Armengaud did not comment on the loss of service authority to the Army and the Navy commands, rather, he deplored the self-imposed fragmentation of the aerial effort inherent in the air service's flawed doctrinal structure. If Air Force leaders refused to acknowledge this serious failing in their doctrine, the least they could do, according to Armengaud, was to incorporate the wartime command structure into the exercise scenarios.⁵⁸ In the 1937 maneuvers, the situation deteriorated further for the Blue Air Force commander. By the third day of the exercise all of the available air units passed to Army and Navy command authority rendering the commander of the 3^e *Armée Aérienne* a commander with no forces to command.⁵⁹ The command structure reverted to the pattern established in the days when aviation served as a combatant arm of the Army. In

⁵⁷ S.H.A.A., Série 2B, Carton 114, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles, État-Major, Le Général de Division Armengaud, Membre du Conseil Supérieur de l'Air, Inspecteur de l'Aviation de Défense Métropolitaine et des Écoles à Monsieur le Ministre de l'Air, État-Major Général de l'Armée de l'Air, 3^{ème} Section, "Manoeuvres Air-D.A.T. en 1936," Message 23/1/I.A.D.M.E. 14 January 1936: 3-4.

⁵⁸ Armengaud was not the only officer to comment on the flawed command structure. The bombardment commander for the 1936 maneuvers observed, "The employment of units in their habitual peacetime configurations and commanded at every level by their normal Chiefs would seem to offer the best guarantee of satisfactory results and security." S.H.A.A., Série 2B, Carton 114, "Exercice Principal de D.A.T.: Compte-Rendu Général du Colonel, Cdt les Forces Aériennes du Parti Bleu," 4 September 1936: 6.

⁵⁹ S.H.A.A. Série 2B, Carton 116, After-action report for 1937 maneuvers, n.a., n.d.: 16.

other words, the senior aviator received mission orders from the commanders of the *Grandes Unités Terrestres*. Even worse, the air service conformed to Army planning procedures. This applied to the extent of requiring orders that tasked air units to perform operational missions to originate from the Army headquarters using Army message formats.

Another doctrinal theme that formed a regular feature of the air maneuvers of the 1930s centered on the tension between offensive and defensive uses of air power. This tension represented the most important source of reactive air doctrine because the offensive nature of air power clashed with prevailing government policies and Army doctrine. The exercises and maneuvers served as poor laboratories for exploring offensive and defensive uses of air power. As French air doctrine matured, the experimental agenda broadened to incorporate a greater variety of operational roles. Consider the limited vision for employing air power expressed in the 1934 maneuvers in which aviation performed as an airborne scouting force for the Army. The reporting official noted "This year marked very sensible progress in the 'Information Search Plan'...The questions asked were clear and specific regarding the priority of possibilities for Aviation; the times, the places that were necessary to reach were clearly defined."⁶⁰ This represented more than a defensive attitude, more than a force that was subordinate to a higher authority. The attitude reflected in this assessment conveys a lack of vision for how Air Force leaders could define objectives outside the context of land warfare. The air service's own critique of air power operations in the 1934 maneuvers revealed a tentative approach to warfare that failed to consider ways to seize the initiative. Airmen

waited for their Army counterparts to delegate tactical missions before considering how to use their special skills to achieve theater and national objectives. This marked one of the boundaries of reactive doctrine in the context of the exercises and maneuvers. Because airmen depended on Army commanders to define the range and scope of campaigns, they restricted their concerns about employing air power to tactical and technical matters.

In the 1935 maneuvers, the exercise evaluators looked deeper into the consequences of how aerial attacks affected operations. The focus remained, however, on tactical rather than on strategic or operational consequences. This continuing trend is not surprising considering the recurring problems the service experienced with technical proficiency. In bombardment operations, evaluators examined how prescribed tactics worked against area targets. Experiments with changes in routes and altitudes revealed that French bomber crews were not ready to adapt to a fluid air war.⁶¹ Thus, another fixture of reactive doctrine began to establish itself in French offensive operations. French bomber doctrine began to rely upon mission commanders who directed every aspect of the attack. These mission commanders became the focal point for successful tactical bombardment operations. And, because of the emphasis on multi-role aircraft, the same structure migrated into other aviation specialties. The mission commander became the only source of creativity and initiative for tactical operations in the *Armée de l'Air*. Aircrews received orders and mission changes from the mission commander, and,

⁶⁰ Ibid., 1.

⁶¹ S.H.A.A., Série 2B, Carton 117, "Exercices d'Application d'Aviation de Défense, 1935," 2 November 1935: 5-6.

absent his direction, could only appeal to higher authority for guidance.

The most damning characteristic of the doctrinal lessons air service leaders pulled from the exercises and maneuvers of the 1930s was the lack of independent conceptions of aerial warfare. The air service published a doctrine that expressed a wide range of aerial missions, but strategic conditions in France lent primacy to defensive forms of warfare. Air power offered the means to halt enemy advances, to strike at enemy second echelon forces, and to threaten enemy vital centers. French air doctrine accounted for all of these possibilities in the concept of the *lutte aérienne*. The exercises and maneuvers of the 1930s failed, however, to realize the promise of the doctrine. The scenarios for aerial maneuvers never accounted for the possibility of an air war without an accompanying ground war. Thus, the doctrinal pronouncements that advocated the primacy of aerial warfare over the battle on the ground never appeared in the exercise and maneuver agenda during the 1930s. Moreover, the ground wars envisioned in the scenarios remained static events in which armies relied upon air power to detect enemy attempts to outflank friendly forces. The Army's constant demand for aerial reconnaissance quickly consumed all of the available aerial resources that the *Armée de l'Air* could provide. Consequently, the doctrine and the scenarios expressed in the maneuvers and exercises failed to connect with the actual employment of French air power.

Because of the wide gulf that existed between doctrinal pronouncements and the actual employment of air forces, the leaders of the *Armée de l'Air* focused almost exclusively on obtaining solutions to tactical problems. Tactical success is certainly an important aspect of measuring military effectiveness. And the *Armée de l'Air* certainly needed a great deal of attention in the tactical arena. The problem came in how French

airmen measured success in the context of exercise and maneuver performance. When objectives described a measure of success in terms of providing security (*couverture*) for air or land forces, the measure of success usually applied reflected sorties flown or reports transmitted—neither of which translates readily into security. Similarly, bombardment crews earned high marks for delivering bombs near their assigned targets. Often the evaluators failed to specify how close to the targets the aircrews delivered their ordnance. Even worse, exercise planners never attempted to correlate the type of ordnance with the particular targets; in the French view of bombardment exercises, one size fit all.

The concern for tactical measures blinded French airmen to operational problems. The fragmented command structure represented just the tip of the iceberg. The lack of adequate training for regulars and reserves certainly hindered the success of many exercises. This was not a question of reserves receiving preference for training and equipment over reserve forces—neither regulars nor reserves received adequate preparation for their wartime missions. But the responsible leaders in the air service never seemed to connect the poor performance in maneuvers to combat potential.

The French vision of aerial warfare appeared to incorporate a rapidly changing air battle. The results of air maneuvers proved this a façade. French airmen were ill equipped to cope with mission changes in any aspect—reconnaissance, pursuit, bombardment, or attack—of air operations. Rigid command structures at the headquarters gave way to rigid combat applications in the formations. The dependence on mission commanders limited flexibility and initiative while it created vulnerability in the tactical units. Unfortunately for France, Air Force leaders approached these deep-

seated problems from a managerial perspective. Rather than reform operational procedures, the Air Staff argued for adjustments to the *tableaux d'effectifs*. Rather than direct changes to unit proficiency training programs, the Air Staff proposed studies of the system. And, perhaps most harmful of all, rather than evaluating exercise performance against an established doctrinal standard, air leaders failed to apply any standard of effectiveness to the results of the exercises of the 1930s. The true, and only, measure of effectiveness for the *Armée de l'Air* came in the crucible of war in 1940.

CHAPTER 6

ASSESSING COMBAT PERFORMANCE AND AIR DOCTRINE

The total number of forces (Army, Navy and Air) in the unoccupied part of metropolitan territory, including Corsica, will not exceed 100,000 men including officers, medical personnel, and military functionaries.¹

French forces collapsed in the face of the German offensive in six weeks of chaotic fighting. Marshal Philippe Pétain assumed the reins of government and appealed to the Germans for an armistice as the Third Republic disappeared in the wake of the defeat. General Charles de Gaulle, the flamboyant advocate of armored warfare, rejected any hint of accommodating the Germans and fled to Great Britain where, on 18 June 1940, he called all French citizens to keep “the flame of French resistance” alive.² French society fractured into groups representing the Vichy regime, de Gaulle’s Free France, Communist sympathizers who viewed the war as the end of capitalism, and average citizens who merely struggled to survive another European war. Within weeks

¹ “Les accords italo-allemandes de Wiesbaden sur l’armée française, 29 Juin 1940 (traduction du compte rendu allemande).” See Claude d’Abzac-Epezy, *L’Armée de l’Air de Vichy, 1940-1944* (Vincennes: Service Historique de l’Armée de l’Air, 1997): 596.

² Charles de Gaulle, *The Complete War Memoirs of Charles de Gaulle* trans. Jonathan Griffin (New York: Simon and Schuster, 1968): 84.

of the disaster, with forces reduced to levels that mirrored the terms of the Versailles Treaty that the Allied powers imposed on a defeated Germany at the end of the First World War, the leaders of the *Armée de l'Air* began to examine the causes of the defeat. The Air Staff, reorganized under the Vichy government, ordered officers who participated at every level in the war effort to compile reports that reflected their experiences and their criticisms of Air Force performance during the hostilities. The Air Staff solicited information regarding organization, command relationships, logistics support, combat experience, technical evaluations of aircraft and other equipment, and doctrine. The directive that ordered this review of combat performance asked for a frank account of the events—"The authors will assess the related events and will express their personal opinions with complete independence of spirit and with sincerity."³ Although reports began to arrive at the Air Staff offices by August of 1940, the final report did not appear until March of 1942. In the intervening months, the Air Staff created a commission, "Commission G," charged with sifting through the reports and arriving at a consensus on the lessons for the future of French air power.⁴

³ S.H.A.A., Série 3D, Carton 519, Secrétariat d'État à l'Aviation, État-Major de l'Armée de l'Air, 3^e Bureau, Le Secrétaire d'État à l'Aviation à MM. le Général Commandant la 29^e Région Aérienne—Chateauroux, le Général Commandant la 32^e Région Aérienne—Limoges, le Général Commandant la 33^e Région Aérienne—Clermont-Ferrand, le Général Commandant la 34^e Région Aérienne—Lyon, le Général Commandant la 35^e Région Aérienne—Aix-en-Provence, le Général Commandant la 36^e Région Aérienne—Montpellier, le Général Commandant la 37^e Région Aérienne—Toulouse, le Général Commandant la 38^e Région Aérienne—Pau, le Général Commandant Supérieur de l'Air en Afrique du Nord, le Général Commandant de l'Air au Levant, le Général Commandant de l'Air à la Côte Française des Somalis, "Enseignements à tirer de la guerre (Forces Aériennes)," Message 11087-3/1-S/E.M.A.A., 23 July 1940: 3

⁴ The Army also launched an investigation into the conduct of the war. The two commissions exchanged information during the course of their investigations. See S.H.A.A., Série 3D, Carton 519, Secrétariat d'État à l'Aviation, État-Major de l'Armée

Commission G operated under severe constraints that stemmed from the German oversight of the Vichy government on the one hand and the duplicitous nature of the Vichy government on the other.⁵ Because of the requirement to reduce the armed forces imposed by the Germans, there were few personnel available to conduct the study; the Air Staff selected Colonel Jean Carayon to chair the commission under the authority of the Air Force Vice Chief of Staff. Carayon later rose to the rank of general in the Vichy Air Force where he served on the staff of the *Secrétariat Général à la Défense Aérienne* (SGDA). He used his position in the SGDA to assemble an effective resistance organization that worked clandestinely with the *Organisation de Résistance de l'Armée* to play a dangerous cat-and-mouse game with the Germans. Carayon hoped to preserve the *Armée de l'Air*'s structure and personnel with an eye toward taking part in the eventual eviction of the German occupation forces from French soil.⁶ The chairman supervised a staff of four officers and six enlisted men.⁷ This small unit operated from a

de l'Air, 3^e Bureau, Le Secrétaire d'État à l'Aviation à Monsieur le Général d'Armée Commandant en Chef des Forces Terrestres, Ministre, Secrétaire d'État à la Guerre, "Enseignements à tirer de la Guerre," Message 101-3/1/E.M.A.A., 26 July 1941.

⁵ Robert O. Paxton's groundbreaking study of the Vichy period remains the starting point for understanding the personalities and issues that drove French society during the occupation. See, Robert O. Paxton, *Vichy France: Old Guard and New Order, 1940-1944* (New York: Columbia University Press, 1972). Philippe Burrin offers a broader perspective of the choices available to French citizens during the occupation. See, Philippe Burrin, *France Under the Germans: Collaboration and Compromise* trans. Janet Lloyd (New York: The New Press, 1996).

⁶ See Thierry Vivier, "La Commission G entre la Défaite et l'Armée de l'Air future (1941-1942), *Revue Historique des Armées* 3, 1989: 113-121. d'Abzac-Epezy, *L'Armée de l'Air de Vichy*: 428-486.

⁷ S.H.A.A., Série 3D, Carton 519, Secrétariat d'État à l'Aviation, État-Major de l'Armée de l'Air, 3^e Bureau, Le Secrétaire d'État à l'Aviation à MM. le Général Commandant la 1^{ère} Région Aérienne, État Major, 3^{ème} Bureau—Aix-en-Provence, le Général Commandant la le Secteur de Défense Aérienne Sud, État Major, 3^{ème} Bureau—Aix-en-

building at the Bordelongue airfield near Toulouse. French authorities feared that German occupation authorities would look unfavorably upon the Commission's efforts; consequently, the Air Staff attached the commission members to the *Service des Archives et du Musée de l'Air* as an administrative cover for their actual duties.⁸ The Commission began work in October 1941, and completed the effort by publishing a 291-page report in March of 1942.

The Commission's final report clearly acknowledged the air service's faults, but the authors struggled to maintain a balanced perspective while simultaneously exposing the numerous and obvious shortcomings that characterized the *Armée de l'Air*'s operations in the spring of 1940. Commission members resisted the temptation to recommend scuttling the French system in favor of the apparently successful German organization and methods. Thus, the recommendations in the final report often followed a conservative path that emphasized reforming or even retaining, the institutional structures of the 1930s rather than urging wholesale structural and doctrinal change. This conservatism prompted the authors to analyze the character of the air operations that continued in the war between Germany, Great Britain, and Russia to discover trends that

Provence, le Général Commandant la 2^{ème} Région Aérienne, État Major, 3^{ème} Bureau—Toulouse, le Général Commandant Supérieure de l'Air en Afrique du Nord, État Major, 3^{ème} Bureau—Alger, le Général Commandant la de l'Air en Afrique Occidentale Française—Dakar, "Commission d'Étude des Enseignements de la Guerre," Message 126-3/1/E.M.A.A., 6 September 1941. S.H.A.A., Série 3D, Carton 519, 2^o Région Aérienne, État Major, 3^o Bureau, "Note de Service," Message 2649/3, 20 September 1941.

⁸ S.H.A.A., Série 3D, Carton 519, État Major de l'Armée de l'Air, 3^{ème} Bureau, Le Secrétaire d'État à l'Aviation à Monsieur le Général Commandant la 2^{ème} Région Aérienne (État Major—3^{ème} Bureau)—Toulouse, "Commission 'G'," Message 205-3/1/E.M.A.A., 24 November 1941.

traced the outlines of aerial warfare both in the present and for the future. The report remains a valuable resource for examining how French air power doctrine evolved after a disastrous defeat. Yet, to read the final report without referring to the reports submitted by the officers who participated in the *tourmente* of 1940 would reveal only part of the story.

Commission officials separated many of the reports submitted by air service officers into subject-related categories. Ultimately, commission members identified twenty-seven separate subjects that touched on every aspect of the *Armée de l'Air's* war effort.⁹ To save time and to facilitate handling of the materials, the commission cut the original reports into strips, sorted the strips according to subject, and glued them onto large sheets of paper. The resulting archival record yielded a meticulously organized, but fragmented series of comments. Commission members annotated many of the strips to indicate which unit submitted the reports, but the mutilation of the original reports made it impossible to reconstruct them. Fortunately, several original reports still exist.

The original reports revealed that the officers who served in the French Air Force approached their duties in a serious, professional manner. Their comments indicated their understanding of interwar doctrines, tactical employment principles, and the shortcomings of their pre-war preparation. The officers who wrote the after-action reports also remained true to the Air Staff directive to render honest and sincere opinions. The comments penned by officers who ranged in rank from Lieutenant to Colonel openly revealed the frustration and agony that plagued the *Armée de l'Air's* officers as they tried

⁹ See S.H.A.A., Série 3D, Carton 508-519, "Rapports des grandes unités."

in vain to defend their nation. The appraisal Commission members produced purged the emotions expressed in the original reports; the result was a sterile, objective account of the lessons learned from the war. Thus, a more comprehensive impression of the *Armée de l'Air*'s effort to learn from the defeat emerges from a comparison of the strips, the surviving complete reports, and the commission's final report.

THE NATURE OF MODERN WARFARE

To many observers the war of maneuver that the Germans visited upon France in May and June of 1940 represented a new revolution in warfare.¹⁰ The commission devoted considerable attention to analyzing whether the nature of war had changed as a result of new tactics and technologies. If the events of 1940 heralded a new form of warfare, the French Air Force of the future needed to adapt to the changes. On the other hand, if the *Armée de l'Air* performed poorly in 1940 because of flawed leadership, flawed policies, or flawed technology, future service leaders could retain the fundamental doctrinal assumptions that prevailed before 1940. The commission carefully examined each possibility to detect how the air service contributed to the defeat before arguing for abandoning the fundamental principles of the 1930s.

¹⁰ Marc Bloch wrote, "What drove our armies to disaster was the cumulative effect of a great number of different mistakes. One glaring characteristic is, however, common to all of them. Our leaders, or those who acted for them, were incapable of thinking in terms of a *new* war. In other words, the German triumph was essentially, a triumph of intellect—and it is that which makes it so peculiarly serious." Marc Bloch, *Strange Defeat: A Statement of Evidence Written in 1940* trans. Gerard Hopkins (London: Oxford University Press, 1949): 36. [emphasis in original]

The tension between offensive and defensive forms of warfare presented a logical starting point for the commission's analysis of the *Armée de l'Air*'s performance against Germany. French strategic calculations throughout the 1930s assumed that the inherent strength of defensive preparations would thwart German hopes for a sudden victory. This assumption constituted one of the fundamental doctrinal breaks between the air and land services during the 1930s. By 1940, however, the land service successfully imposed its vision of how to wage war upon the *Armée de l'Air*.

As war, both phony and real, descended upon the French, airmen experienced two major service reorganizations designed to achieve closer integration with the Army's views of how to conduct a defensive theater-level war. The first, in September 1939, aligned the air units with the major Army zones of operations, the second, in February 1940, established a command structure that divided responsibility for air operations between the applicable Army zone of operations commanders, the newly established *Forces Aériennes de Coopération* (FAC) commanders, and the Air Force Commander in Chief.¹¹ The new command arrangements forced the air service to jettison its fundamental precepts of *lutte aérienne* in which air power could play an independent, primary role while land forces supported aviation with maneuver and land-based anti-aircraft defenses. Confronted with Army demands for greater control over air operations, the *Armée de l'Air* dismantled its *Grandes Unités Aériennes* and *Air Régions*. The French Air Force fought the Germans with its combat power dispersed among the Army commands.

¹¹ See Patrick Facon, *L'Armée de l'Air dans la Tourmente: La Bataille de France, 1939-1940* (Paris: Economica, 1997): 109-114.

The process of subordinating the air forces to the Army zone of operations commanders, begun in September 1939 and completed by February 1940, affected airmen from the declaration of war until the armistice. One of the most dramatic effects that the new command structure exerted on air service tactical employment was the isolation of air groups from higher echelons. Individual flying unit commanders reported receiving orders to relocate as many as eighteen times between September 1939 and June 1940.¹² For the aviators, this meant little more than flying to a new landing field. For the essential support units (mechanics, services, administration, communications, and air base defense) that remained attached to each flying organization, however, the moves involved chaotic journeys using rail and road routes. Often support units arrived at newly assigned locations to find their parent flying organizations had moved once again. The separation of combat and combat support units affected flying operations. Lieutenant Colonel Demery, commander of the *Groupeement d'Aviation d'Assaut N° 18*, observed that "from the unleashing of operations the groups were, and remained thereafter, totally isolated from resupply organizations, depots, and technical organizations..."¹³ Even during the relatively benign phony war, the defensive positional warfare that the Army anticipated became a constantly shifting war of maneuver for the *Armée de l'Air*.

The failure of Army leaders to comprehend that defensive operations in the air could not remain tied to maneuver schemes conceived for land units deprived the airmen

¹² See the various original reports in S.H.A.A., Série 3D, Carton 508-513.

¹³ S.H.A.A., Série 3D, Carton 512, 2° Région Aérienne, Groupeement d'Aviation N° 18, État-Major, "Compte-Rendu au Sujet des Enseignements de la Guerre par le Lt. Colonel Demery, Commandant le Groupeement d'Aviation d'Assaut N° 18," Message 4477, August 1940: 8.

of the ability to mass their forces to defend critical points. As for attaining unity of effort, the airmen labored under an unfamiliar and unwieldy command structure that often left them ignorant of the intentions of the commander of the zone of operations. The commander of Bombardment Group 2 noted, "The difficulties encountered in the exercise of interior command resulted principally from the mediocrity of the means of communication that prevented sure and rapid liaison which is of capital importance in the execution of missions against mobile and intermittent objectives."¹⁴ Therefore, the airmen, divorced from strategic and operational vision by the new command structures, and unable to develop a coherent tactical perception of the battlefield, reverted to a reactive posture characterized by the grim determination to contribute in the most effective ways possible.

Ironically, the commission concluded that the type of war that occurred in 1940 fit well into French conceptions of air power. Flexibility and initiative at all levels of command would characterize future operations according to the commission's final report. The most deficient area for French operations lay in the fragmented command relationships that existed between the Army, the Air Force, and the national political-military command authorities. Although General Gamelin, and later General Weygand, guided the war effort in principal, their efforts proved woefully inadequate to the pace,

¹⁴ S.H.A.A., Série 3D, Carton 511, "Enseignements Pouvant Être Tirés des Conditions dans Lesquelles Furent Engagées les Unités de Groupement de Bombardement N° 2—22 Mai au 14 Juin 1940," n.a., n.d.: 4.

scope, and complexity of modern war.¹⁵ The military establishment of the future, and, by extension the future Air Force, required a *commandant du théâtre d'opérations* who could effectively control the combined air, land, and naval operations that would represent the rule rather than the exception in future operations.¹⁶ The commission argued that the absence of such a commander, a commander morally, intellectually, and materially adapted to his mission, could only result in renewed disaster.

For all combat forces, but especially for air forces, the commission advocated a reformed organization to support the theater commander. The new organization had to be rational, decentralized, equipped with modern, high-speed communications, and prepared intellectually to cope with the forms of modern war.¹⁷ Tactical experience confirmed the

¹⁵ For an analysis of Gamelin's role in the exercise of command and his relations with the air service see Martin S. Alexander, *The Republic in Danger: General Maurice Gamelin and the Politics of French Defence, 1933-1940* (Cambridge: Cambridge University Press, 1992). For Weygand's assumption of command and his subsequent failed attempt to salvage French fortunes see William L. Shirer, *The Collapse of the Third Republic: An Inquiry into the Fall of France in 1940* (New York: Simon and Schuster, 1969): 698-756. General de Gaulle recorded his impression of Gamelin in his *Memoirs*. He wrote, "Listening to him, I was convinced that, by dint of carrying about with him a certain military system and applying his labour to it, he had made of it a faith. I felt too that referring himself to the example of Joffre, whom he had assisted at close quarters and to some extent inspired in the early days of the First World War, he had persuaded himself that, at his level, the essential thing was to fix one's purpose, once for all, upon a well-defined plan and then not to let oneself be deflected from it by an avatar." De Gaulle judged Weygand more sympathetically: "At one go there had fallen on his shoulders a crushing burden he was not built to bear. When, on May 20, he had taken over the supreme command, it was too late, without any doubt, to win the Battle of France. It seems likely that the realization was a surprise to him. As he had never considered the real possibilities of mechanized force, the immense and sudden effects produced by the enemy's resources stupefied him." de Gaulle, *The Complete War Memoirs*, 34-35, 50-51.

¹⁶ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Première Partie, Les Conditions de la Guerre Moderne," March 1942: 8-9.

¹⁷ *Ibid.*, 9.

commission's conclusions. Lieutenant Colonel Castet, commandant of the 19th

Groupeement d'Aviation d'Assaut, reported:

The existing organization permitted:

- neither the rapid execution [of missions] that would allow the delivery of a stopping blow against the enemy advance because of the delays in the conception and transmission of orders;
- nor massing of assault aviation because of the very small number of assault units, the scattering of the commands, and the large number of objectives attacked simultaneously;
- nor the effective protection [of assault units] by friendly pursuit because of the impossibility of personal liaison between assault and pursuit.¹⁸

Castet criticized the organization for its tactical flaws. Another author echoed Castet's observations. He wrote, "Our ties with the Zone of Aerial Operations were completely broken..."¹⁹ The commission interpreted the problems that prevented the *Armée de l'Air* from achieving mass and unity of effort as symptoms of a higher-level organizational problem.

The theater command philosophy—in effect, a joint force command structure—the commission advocated relied upon the primacy of land warfare. In response to the accusations that the French Air Force was weak in 1940, the commission responded "In May 1940, a [more] powerful French aviation could only have delayed defeat, not prevented it."²⁰ According to this view, land forces provided the war-winning element—

¹⁸ S.H.A.A., Série 3D, Carton 512, 2^o Région Aérienne, 19^o Groupeement d'Assaut, État-Major, "Rapport sur l'Organisation, le Fonctionnement, et l'Emploi du 19^o Groupeement d'Assaut au Cours de la Guerre 1939-1940," 13 August 1940: 6-7.

¹⁹ S.H.A.A., Série 3D, Carton 513, "L'Aviation dans la Bataille des Flandres," n.a., 20 August 1940: 2.

²⁰ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Première Partie, Les Conditions de la Guerre Moderne," March 1942: 10.

air and sea forces only helped to establish the conditions for victory. Thus, air power, properly applied, supported the joint force commander's theater objectives.

The dramatic contribution that German air power offered to the ultimate outcome of the Battle of France presented French airmen and the commission members a paradox that led to a corollary to the principle that asserted the primacy of land forces. The experience of the *tourmente* revealed that no nation would seriously attempt to wage war in the future without considerable aviation assets. In other words, land forces could not win the campaigns of the future without air support—the commission even went as far as to conclude that air superiority set the essential conditions for victory on the ground.²¹ This symbiotic relationship between air and ground power helped the commission to define future organizational and force structure requirements for the *Armée de l'Air*.

The difference between French and German approaches to employing air power in the war of 1940, according to the commission, lay in the contrast between the German combined arms team and the fragmented French command structure. This adjustment allowed the Germans to conceive and execute offensive operations while the French remained paralyzed and incapable of adapting at the operational or tactical levels of war to counter the German air-land thrusts. As the authors observed, "In 1940, the French military forces were defeated by an adversary that had created, focused, and applied a doctrine of offensive combat, based upon massive action and on the direct collaboration of an independent Air Force and armored formations engaged simultaneously in battle."²² The innovation achieved by the Germans stemmed from their use of air power to support

²¹ Ibid., 11.

²² Ibid., 18.

offensive operations on the ground—not from the German use of armored forces.

Therefore, the commission proposed a strong defensive air arm designed to cooperate intimately with land forces to break the cohesion between enemy air and land forces.

The principle of cooperation between air and ground forces existed in French air service doctrines throughout the 1930s. Several reports emphasized the clearly defined doctrinal principles that outlined how air forces should cooperate with land forces.²³ Air service experiences indicated that the fault in 1940 lay in the absence of procedures, equipment, and training that made coordination and communication possible between air and land units. Air power, properly applied in the context of the land battle, assured the freedom of maneuver for land forces by gaining air superiority. Air power also guaranteed the security of land forces by finding and fixing enemy mobile forces so that friendly land forces could concentrate against them. Finally, air power could constrain enemy maneuver possibilities by depleting follow-on strength through attacks against supplies and transportation networks.²⁴

The commission struggled with a vision of air power that remained tied to the terrestrial battle. The same characteristics that allowed air power to guarantee the security of friendly land maneuver forces also offered expanded possibilities for attacks against operational centers of gravity. The commission authors argued, "The initial action aimed at totally paralyzing the enemy organs of command, from the outset, could

²³ See for example, S.H.A.A., Série 3D, Carton 513, 1ère Région Aérienne, Base Aérienne Centre de Demobilisation de Nîmes, "Travail du Lieutenant-Colonel Bourdier: La Mission de Protection en Chasse d'Armée," Message 1321/E. M., 17 August 1940.

²⁴ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,' : Première Partie, Les Conditions de la Guerre Moderne," March 1942: 20.

cause them to lose all freedom of action on the battlefield. It seems that, in general, this initial action has been established *a priori*, and *regulated according to an hourly precondition*.”²⁵ In other words, the commission noted that effective operations in maneuver warfare required reliable communications between maneuver elements and the operational command echelons. Air power could halt enemy offensives by breaking the links between tactical units and the operational commanders. Despite the obvious benefits gained under the joint command structure in terms of unity of command, the commission members could not escape the wider possibilities that three-dimensional warfare offered modern commanders.

As Colonel Carayon and his team struggled with issues of command relationships between air and land forces, they found themselves returning to the structures contained in *lutte aérienne* found in the doctrines of the 1930s. The authors concluded that the development of mechanized and motorized forces in land warfare resulted in the possibility that offensive and defensive battles would occur simultaneously in the same theater. Similarly, the addition of air power to the modern battle forced theater commanders to consider offensive and defensive objectives in the air war. As they wrote in the final report, “...it is no longer adequate to speak of the terrestrial battle, but instead of the aero-terrestrial battle in which the actions of land forces and those of the air forces, directly combined, are pursued normally during the entire duration of the battle...”²⁶

This expression of the characteristics of modern war reflected little change from the descriptions contained in the pre-war doctrine; in the 1930s, however, French airmen

²⁵ Ibid., 21 [emphasis in original].

²⁶ Ibid., 24.

speculated about the primacy of air power and about the possibility that land forces would support the aerial fight. Now, they rejected, or at best only hinted at, the possibility that air power could dominate the war effort.

The leaders of tactical units who provided critiques of Air Force performance did not provide clear evidence upon which the commission could base its conservative conclusions regarding the relationship between air and land forces. The reports were virtually unanimous in their condemnation of the lack of communication within the air service and with the Army units they supported. None of the surviving original reports, however, contained opinions that supported a permanently subordinate role for the *Armée de l'Air*. At the tactical level, the airmen expressed frustration over inadequate equipment—"...a single Potez 63, capable of 400 km per hour with only one machine gun mounted in the rear for defense with a 30° field of fire, could hope neither to attack the German pursuit planes capable of 500 km per hour, nor to resist alone against a patrol of two or three such pursuits each equipped with four machine guns..."²⁷ Or at the poor quality of the communications support—"The radiotelegraphic liaison never worked between the Forces Aériennes du Corps d'Armée despite all the efforts of the command."²⁸ But French airmen rarely questioned the assumptions of their fundamental

²⁷ S.H.A.A., Série 3D, Carton 508, Armée de l'Air, 2° Région Aérienne, Commandant des Bases Aériennes de Tarn et Garonne, et du Lot, Base Aérienne de Moissac, "Rapport du Commandant Levesque, Ex-Commandant des Forces Aériennes du 8° Corps d'Armée au sujet de l'organisation et de l'emploi des Forces Aériennes de Renseignement," Message 100/C/1, 24 August 1940: 2.

²⁸ S.H.A.A., Série 3D, Carton 508, 4° Région Aérienne, Base Aérienne de Lyon et le Groupement Nord, Lieutenant-Colonel Seive de la Base Aérienne de Bron à Monsieur le Général Commandant la 4° Région Aérienne, "Rapport sur l'organisation et l'emploi des Forces Aériennes de Renseignements," Message 276/B.G.N, 20 August 1940: 5.

doctrines.

The joint theater command that Colonel Carayon and the other commission members advocated reinforced an established tradition toward reactive air doctrine within the air service. The structure of the joint forces command forced senior aviators into roles as technical advisors to the joint force commander (who would always be an Army general). Commission members argued, "It remains, then, for the aerial commander to adapt the activity of his forces constantly, within the context of the assigned mission, to the unfolding operations. It is necessary for him to *live the battle*, to take daring initiatives at the right time, and to respond and even to anticipate the desires of the land forces."²⁹ The attention of the Air Force commander remained limited, in this characterization of future war to the pace, scope, and time constraints of land warfare. But more importantly, the commission's formula restricted the airmen's exercise of initiative to the unfolding land battle. This limited vision guaranteed that French airmen would continue to react at the operational and tactical levels of war. The airmen could not develop and articulate alternative visions of how to accomplish strategic or operational objectives because they owed total allegiance to the land commander.

DEFINING THE CHARACTERISTICS OF AIR POWER

The approach the members of Commission G adopted to define the characteristics

²⁹ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Première Partie, Les Conditions de la Guerre Moderne," March 1942: 29. [emphasis in original]

of modern warfare led to a narrow emphasis on the tactical details of aerial warfare. To a certain degree, this focus stemmed from the commission's mandate to derive lessons for improving tactical effectiveness of the Air Force. If the *Armée de l'Air* of the future should depart from the institutional structures of the past, the service's tactical composition would necessarily change to conform to new fundamental and organizational models. The joint theater command that the commission advocated as the model for a revised fundamental and organizational doctrine, however, preserved the tactical categories of aviation that dominated French air power thought since the First World War. French airmen perceived only one revolutionary application of air power in the campaign of 1940—airborne assault and its corollary, aerial transport—the remaining tactical missions conformed to old formulas that relied upon aviation to contribute bombardment, pursuit, and reconnaissance to support the ground battle.

The German use of air transport and airborne troops opened new possibilities for the marriage of air and land power. The French, largely at Pierre Cot's urging, experimented with airborne troops, *l'Infanterie de l'Air*, in the 1930s. The leaders of the *Armée de l'Air* published tactical doctrine manuals, provided training, equipment, and personnel to create a force similar to the German paratroop force that caused such havoc in Holland and Belgium in 1940 and in the assault on Crete in 1941. The results that the Germans achieved with lightly armed paratroops and glider borne assault forces surpassed French expectations for such forces. The commission's final report contained the observation that airborne operations "suddenly opened distant theaters through combined operations in which aviation played an important role;" the authors concluded

that such operations “constituted one of the interesting lessons of the current conflict.”³⁰

German airborne assaults and the collapse of the Belgian fortress at Eben Emael shocked the French into an awareness of new possibilities for vertical envelopment and strategic effectiveness.³¹

Commission members chose to use the lessons gleaned from the German successes with airborne troops to argue for a greatly expanded air transportation arm in the *Armée de l’Air* of the future. The authors settled upon the phrase *aviation de débarquement* to characterize a wide range of aviation activities.³² The first characteristic of the new arm conformed to the model established by the Germans. French airmen could deploy in force using parachute or landing assaults deep in enemy territory. These missions would meet stiff enemy resistance and would require close coordination and cooperation between air and ground commanders to ensure the survival of the airborne force.³³ Ironically, this mission assumed that French military and political leaders would pursue offensive strategies predicated upon a war of movement—the antithesis of interwar strategies and policies.

³⁰ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d’État à l’Aviation, “Enseignements Aériens de la Guerre, 1939-1942, Commission ‘G,’ : Deuxième Partie, Les Armes et les Moyens d’Exploitation,” March 1942: 139.

³¹ For a discussion of the role of airborne troops in the German assault on Holland and Belgium, see Shirer, *The Collapse of the Third Republic*, 604-611. For the assault on Crete, see Gerhard L. Weinberg, *A World At Arms: A Global History of World War II* (Cambridge: Cambridge University Press, 1994): 227-230.

³² S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d’État à l’Aviation, “Enseignements Aériens de la Guerre, 1939-1942, Commission ‘G,’ : Deuxième Partie, Les Armes et les Moyens d’Exploitation,” March 1942: 139.

³³ The French military realized this vision of airborne assaults in the ill-fated attempt to defeat Vietnamese Communist forces in the First Indochina War. See Bernard B. Fall, *Street Without Joy* (Mechanicsburg, PA: Stackpole Books, 1989).

The second category commission members outlined for *aviation de débarquement* represented a traditional support role. Transportation aviation offered new possibilities for supporting air and land forces. France lacked this capability in the 1930s for several reasons. The most obvious reason that the aviation industry failed to provide a credible airlift plane to the military centered on the lack of clearly defined military requirements for such aircraft.³⁴ The *Armée de l'Air* relied upon converted or obsolete bombers and light transport airplanes to deliver the small volume of cargo required by interwar operations and maneuvers. The pressure brought on by the worldwide economic crisis provided another brake on French transport aviation development.³⁵ Finally, the confines of Western Europe coupled with the absence of power projection strategies among French politicians and generals restricted air transport development. The dominance of defensive strategies encouraged French military leaders, including Air Force leaders, to rely upon the railroad network to provide operational and tactical support rather than developing aerial transportation networks. The war changed French perceptions regarding the utility of strategic and operational air cargo movement.

The final *aviation de débarquement* category commission members identified represented the only element that existed in significant numbers in the French air service

³⁴ The French concentrated on producing combat aircraft during the 1930s. Economic and political conditions precluded a wider research and development program that included the full range of transport aircraft. Late in the decade, the *Armée de l'Air* considered designs for aircraft capable of transporting the Renault tank. See S.H.A.A., Série 2B, Cartons 165-169. Patrick Facon studied the various airplane production plans of the late 1930s. See Patrick Facon, "Le Plan V (1938-1939)," *Revue historique des armées*. 4, 1979: 102-123.

³⁵ For an analysis of how French aviation industry developed, see Emmanuel Chadeau, *L'industrie aéronautique en France, 1900-1950: De Blériot à Dassault* (Paris: Fayard, 1987).

of the 1930s. Liaison aircraft provided a tactical solution to the problems brought on by dispersing air units among the Army theater commands. By operating in a tactical airlift role, liaison aviation could deliver personnel and cargo to combat units that became isolated from the Air Force support infrastructure. Conceived in this way, liaison aviation provided the joint theater commander with a flexible means of reinforcing tactical units as well as a tactical reserve that could help to keep units in the fight longer. The problem in 1940, as the commission understood it, was that there were too few of the liaison aircraft and crews spread across the air service to function effectively.³⁶

Colonel Carayon and his team of analysts departed from their usual conservatism when describing the potential importance of *aviation de débarquement* missions. For the first time in the final report, the authors did not couch their arguments in terms related to the joint force command structure or how the air service could contribute to accomplishing joint theater objectives. The commission report stopped short of making an overt declaration for an independent role for air power and airmen. But the authors clearly implied that the complexity of aerial transport missions, the cost of the planes, the speed with which such missions unfolded, and the risk to personnel meant that airmen should take the lead role in planning and executing these new missions. According to the commission's report, "a transport operation should not be improvised but should be meticulously prepared...the general direction of the operation should be assumed by a *specialist* acquainted with the difficulties of the enterprise."³⁷ The airmen witnessed the

³⁶ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 139.

³⁷ Ibid., 148. [emphasis added]

operational successes achieved by German aerial assault forces in the campaign of 1940; through their analysis of the lessons from the defeat, they expressed a desire to control this apparently important weapon in the *Armée de l'Air* of the future. Curiously, however, the commission members elected to frame their analysis of traditional aerial missions (bombardment, pursuit, and reconnaissance) within the context of the joint theater war.

Bombardment aviation failed to supply the shock, stopping power, or material destruction that French strategists demanded in 1940. This happened, in part, because bombardment units had little experience with executing attacks against mobile ground combat units. Interwar training and exercise opportunities focused on using bombers to attack pre-planned stationary targets. Enemy industrial areas and communication nodes occupied first priority in French bombardment plans during the 1930s. The air service developed detailed plans, complete with target dossiers, aimed at destroying key German and Italian industrial areas.³⁸ When the Army called for bombers to plan attacks against enemy land forces in the interwar years, supply depots, marshaling areas, and communications networks were the typical targets—all readily identifiable and stationary targets. The target sets conceived in the interwar bomber plans required precise information about the target area. Moreover, successful attacks required nearly perfect

³⁸ The target dossiers contained plans for attacks against critical industries. *Armée de l'Air* planners concentrated on German and Italian aircraft industrial facilities, electrical power production, petroleum refineries, airfields, railroads, canals, and ports. French airmen anticipated that their enemies would bombard French towns to weaken civilian morale. They selected several German and Italian towns as reprisal objectives. See S.H.A.A., Série 2B, Cartons 65-76, 83-94.

flying conditions enroute to the target area along with good visibility over the target because of the lack of proficiency among French bomber crews.

The French bomber units encountered a war that differed from the one for which they planned. The hard-pressed Army units demanded rapid response from the bomber *groupements* to help slow the German advance—bomber crews proved inadequate to the task. General Pastier, the Bombardment Inspector General, observed “bombardment [aviation] could only intervene after serious delays, in some cases on the order of four hours after receiving information from reconnaissance airplanes: it is fully evident, in these conditions, that the fleeting objectives indicated could not always be located by the aircrews.”³⁹ Pastier blamed the convoluted command structure that bound the airmen to the Army commands for many of the delays that he witnessed. He also observed that the French failed to maintain air superiority over their territory. The presence of German pursuit planes over the battlefield prevented the French bombers from influencing the contest on the ground.⁴⁰

The airmen complained that the published tactical doctrines of the interwar years failed to anticipate the circumstances of the German assault. One officer observed “The employment doctrine learned before the war was not confirmed by experience...In effect, the conditions in which Bombardment [aviation] was employed could not be made the

³⁹ S.H.A.A., Série 3D, Carton 511, Commandement en Chef des Forces Aériennes, Inspection de l’Aviation de Bombardement, Le Général de Corps Aérien G. Pastier, Inspecteur de l’Aviation de Bombardement à Monsieur le Général Commandant en Chef Les Forces Aériennes, “Enseignements de la Guerre,” Message 108/I. B./S. C., 6 June 1940: 1.

⁴⁰ Ibid., 9-10.

object of any regulatory prescription.”⁴¹ The departure from published doctrine, the fluid nature of the battle, the effective employment of German pursuit and ground-based defenses, and the fragmented French command structure prevented the *Armée de l’Air*’s bomber fleet from achieving any semblance of cohesion or effectiveness in the Battle of France.

Colonel Carayon and the other commission members acknowledged that the mobility of land forces on the modern battlefield made bombardment operations more complex than interwar airmen anticipated. According to the commission’s report, the joint theater command could solve the coordination problems that plagued bombardment efforts in 1940. Training and specialization would remedy many of the other tactical problems that hindered the bomber crews. Commission members readily acknowledged the sorry state of bombardment, and Air Force, training before the war. Captain Meiffren of *Groupe Aérien 1* of Bombardment Group 23 reported, “...certain reserve maintenance company commanders and flying personnel expressed a certain repugnance at times for tasks for which they felt, with good reason, ill-prepared to perform or that could not be done.”⁴² The commission assumed that future government and military leaders would ensure adequate funding and material to provide realistic and effective combat training. Consequently, the final report focused on defining future specialized mission requirements for bomber forces.

⁴¹ S.H.A.A., Série 3D, Carton 511, “Enseignements Pouvant Être Tirés des Conditions dans Lesquelles Furent Engagées les Unités de Groupement de Bombardement N° 2—22 Mai au 14 Juin 1940,” n.a., n.d.: 11.

⁴² S.H.A.A., Série 3D, Carton 511, Capitaine Meiffren, Group Aérien 1/23, “Enseignements à Tirer de la Guerre,” n.d.: 7.

Bombardment aviation represented the most deadly and most flexible arm available to French air power. However, interwar airmen exaggerated the destructive potential of bomber forces. The Commission advocated changes to ensure that future doctrines would not make the same mistake. Strategic targets, those targets that sustained the enemy material or moral capability to fight, were difficult to attack successfully. The authors of the final report noted, "destruction cannot be obtained definitively in a single blow, either the amount of projectiles dropped are insufficient to achieve it, or the objective can be rapidly repaired."⁴³ Because of the delays inherent in realizing the effects of such missions, the commission cautioned against launching attacks that did not relate directly to the outcome of the land battle. Moreover, the direct effects of aerial bombardment upon enemy fielded forces contributed in measurable ways to the joint force commander's campaign goals. Thus, for future bombardment operations, the authors argued that the joint theater command should receive first priority when assigning bombardment objectives.

The requirement to support the theater commander's efforts helped to define tactical categories for bombardment aviation. Dive bombing tactics, used so effectively by the Germans in the campaigns of 1940, received first consideration in the commission's tactical recommendations. Ironically, the *Armée de l'Air* conducted extensive experiments with dive bombing tactics in the 1930s before choosing to abandon the procedure. Airmen at the *Centre d'Expériences Aériennes Militaires* at Reims used

⁴³ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 53.

the tactic in several experiments against objectives that included railroad lines, tanks, and fortifications. Although the tests revealed that the tactic promised to increase accuracy, French airmen concluded that the maneuver was too difficult and dangerous for French pilots to perform. The *Armée de l'Air* training programs did not prepare bomber aircrews to perform the tactic; existing French airframes could not sustain the g-forces required as pilots pulled the airplanes out of the dive.⁴⁴ The French elected to rely upon traditional level-flight bombardment tactics as they prepared to fight Germany in the 1930s. The commission saw this as a mistake that cost the French dearly in the Battle of France because it robbed the *Armée de l'Air* of the ability to strike German armored forces accurately.

The authors of the final report divided bombardment targets into two broad categories: targets located on the battlefield and all other targets. These categories conformed nicely to the commission's focus on the terrestrial battle. But the emphasis on restricting the mobility of enemy forces using aerial attacks was not new to French airmen. Pierre Cot correctly assessed the outlines of German strategy in the late 1930s. He argued that air power represented the only way for France to thwart German hopes for a short war.⁴⁵ The most aggressive and innovative aerial maneuvers and exercises of the 1930s, particularly the 1937 maneuvers and the aborted 1938 maneuvers, sought to

⁴⁴ See S.H.A.A., Série 2B, Carton 110, Capitain Secrétaire, Centre d'Expériences Aériennes Militaires—Assaut, Rapport d'Ensemble: Procédés de Destruction des Voies Ferrées par l'Aviation d'Assaut," Message 361/S, 15 April 1939. S.H.A.A., Série 2B, Carton 111, Centre d'Expériences Aériennes Militaires, "Note sur l'Attaque de Chars par l'Aviation," Message 069/S, 26 January 1940.

⁴⁵ Pierre Cot. *L'Armée de l'Air, 1936-1938* (Paris: Éditions Bernard Grasset, 1939).

develop methods for the *Armée de l'Air* to use against mobile land forces.⁴⁶ In practice, Army commanders used bombardment units as airborne artillery platforms. One officer noted that "medium bombardment units were used solely to overcome the weaknesses of artillery and to give the infantry the impression that our aviation was present in the battle..."⁴⁷ Commission G proposed a bombardment force dedicated to attacks against enemy armored formations, motorized columns, troops, entrenched personnel, cantonments, bridges, boats, fortifications, and supply depots.⁴⁸ This prioritization scheme promised to guarantee that bombardment air power would remain at the beck and call of land unit commanders for the duration of operations.

The airmen offered the catchall category of "other objectives" in the unlikely event that the bombers destroyed all of the targets designated by Army commanders. Yet, the other objectives envisioned by the commission authors remained limited to those targets that contributed to the unfolding terrestrial battle. Bombers could reach behind enemy lines to attack enemy rail lines, roads, marshaling yards, repair depots, warehouses, towns, and air bases.⁴⁹ Conceived in this way, bombardment aviation conformed to the restricted vision of air power that prevailed among Army leaders in the interwar years. The effectiveness of the German combination of air and land power in

⁴⁶ See Chapter 5 for the discussion of the *Armée de l'Air*'s maneuver and exercise program.

⁴⁷ S.H.A.A., Série 3D, Carton 511, Capitaine Plique, "Rapport sur les Enseignements à Tirer de la Guerre, 1939-1940," n.d.: 7.

⁴⁸ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 60-63.

⁴⁹ Ibid.

1940 discouraged French airmen from articulating a vision, similar to the doctrines established in the Royal Air Force and the United States Army Air Corps, of how air power could achieve strategic objectives independent of theater land objectives.

By accepting directions for bomber targeting from land commanders, the *Armée de l'Air* rejected the possibility of using its most potent offensive force to influence a wider range of targets. The philosophy that restricted bombardment aviation to tactical, or at best lower order operational, objectives promised to prevent airmen from having a voice in formulating theater strategies. A cardinal principle for French air power in the 1930s asserted that there would never be enough aviation resources to fulfill strategic, operational, and tactical requirements. The commission's report accepted that this condition would prevail in the future.⁵⁰ The commission essentially advocated placing bombardment groups in an on-call close air support role—this meant that the air service would conduct future bombardment operations with a built-in reactive, tactical approach.

Pursuit aviation fared no better than bombardment aviation in the post-debacle critiques submitted by tactical unit commanders. The problem for the fighter forces centered on personnel, organizational, and technical issues. Colonel Boucher, a veteran fighter pilot who commanded aviation units for the IV Army in 1918, predicted disaster as early as December 1939 when he described the problems that plagued pursuit units. "The shortage of pilots," he wrote, "in the pursuit and reconnaissance groups is flagrant. The IV Army pursuit group, which is authorized 34 single-seat planes, has, in reality,

⁵⁰ Ibid., 59.

only 23 available along with only 17 pilots.”⁵¹ Air service leaders failed to take effective measures to correct the personnel problems.

As the German attack unfolded, French fighter pilots discovered that their equipment placed them at a technical disadvantage. The Air Staff knew about the poor performance of French fighters well before the German attack in May 1940. The same report that warned about the personnel shortage also drew attention to technical deficiencies in the French fighter force.

The current material, excellent against the Messerschmidt 109, seems to be clearly dominated by the enemy single-seat planes which are appearing. The Dewoitine 520 and the Bloch 152 seem equally destined to be outclassed by the new airplanes. It is necessary, then, to obtain without delay material capable of 560 km/h, strongly armed (1 canon, 4 machine guns), with a greatly reduced minimum speed to allow take off and landing on relatively short fields.⁵²

Reports from pursuit aviation units after the armistice echoed Colonel Boucher’s themes citing the inferiority of French fighter speed, armor, and armament.⁵³

Despite the flaws in French pursuit organization and equipment, Commission G’s final report indicated that pursuit aviation performed better than any category of French air power. The authors claimed that French fighter pilots scored nearly 1,000 aerial victories while suffering only 362 losses to German fighters.⁵⁴ The ensuing “Myth of the 1,000 Victories” provided airmen with evidence to counter the accusation that the *Armée*

⁵¹ S.H.A.A., Série 3D, Carton 477, “Rapport du Colonel Boucher au Général Pretelat,” 1 December 1939: 8.

⁵² Ibid., 20-21.

⁵³ S.H.A.A., Série 3D, Carton 516, “Enseignements à Tirer de la Guerre, Titre 25, Matériel: Chapitre 1—Avions,” n.a., n.d.

⁵⁴ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d’État à l’Aviation, “Enseignements Aériens de la Guerre, 1939-1942, Commission ‘G,’ : Deuxième Partie, Les Armes et les Moyens d’Exploitation,” March 1942: 107.

de l'Air abandoned the nation in its hour of greatest need.⁵⁵ The commission attributed the apparent success of the fighter forces to solid preparation and doctrine during the interwar years. The success achieved in air-to-air combat concealed troubling problems in other pursuit mission areas. Rather than tarnishing the reputation of the pursuit arm by simply listing the shortcomings of the fighter force, the commission members packaged their critique to emphasize minor adjustments to tactics and procedures. The resulting report recommended few changes for the pursuit doctrines and organizational structures from those of the 1930s.

With its inherent ability to battle the opposing air force for air superiority, pursuit aviation represented the most important organizational air component according to the commission. Tactical air commanders agreed. A bombardment group commander related that German pursuit planes appeared to shadow French bomber formations for the purpose of notifying ground-based air defense units of their speed and altitude. The French airmen subsequently encountered deadly and accurate anti-aircraft artillery barrages.⁵⁶ Colonel Dumemes, commander of *Groupeement de Chasse N° 22*, condemned the inferiority of French pursuit planes as well as the fragmented command structure that

⁵⁵ Patrick Facon recently examined the persistence of the "Myth of the 1,000 Victories." He notes that partisan emotions dominate the issue, which makes resolution extremely difficult. Several sources provide conflicting data on the exact number of French aerial victories ranging from 594 to 1,060. The statistics on French aerial losses to German fighters has a narrower range of 757-892. See Facon, *L'Armée de l'Air dans la tourmente*, 247-263.

⁵⁶ S.H.A.A., Série 3D, Carton 511, Commandement en Chef des Forces Aériennes, Inspection de l'Aviation de Bombardement, Le Général de Corps Aérien G. Pastier, Inspecteur de l'Aviation de Bombardement à Monsieur le Général Commandant en Chef Les Forces Aériennes, "Enseignements de la Guerre," Message 108/I. B./S. C., 6 June 1940: 4.

resulted in the dispersal of French air superiority efforts against the Luftwaffe. Dumemes argued forcefully for a single commander for all pursuit operations.⁵⁷

The commission adopted a more conservative path, however, that conformed to the joint theater command structure and the primacy of land warfare over other forms. Rather than arguing for a single pursuit command, the commission proposed to "organize the operational Air Force into *grandes unites aériennes mixtes* which will always contain pursuit aviation formations as a minimum."⁵⁸ The influence of the joint theater command structure discouraged arguments for a stronger, more independent organization in the future for the *Armée de l'Air*.

The commission's approach prevented considerations of organizational alternatives in which the *Armée de l'Air* assumed an equal or a more important role than that of the joint force commander. In other words, in the commission's view, the possibility of planning or executing air operations apart from the joint operational context did not exist. The authors argued further, "Because of the permanence of the danger from the air, every unit of the Army, the Navy, and the Air Force should possess its own organic means of defense against air attacks to guarantee security."⁵⁹ This amounted to an assertion of the principle of unity of command for pursuit operations while denying the means to achieve it by dispersing pursuit resources among every unit in the French military establishment.

⁵⁷ S.H.A.A., Série 3D, Carton 510, "Travail du Colonel Dumemes, Commandant le Groupement de Chasse N° 22," 30 December 1940: 24.

⁵⁸ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Première Partie, Les Conditions de la Guerre Moderne," March 1942: 11.

⁵⁹ Ibid., 11.

The loss of local air superiority to German air forces represented one of the greatest concerns for French air power during the campaign of 1940. Bombardment and reconnaissance units felt this loss to a greater extent than any other air arm; the commission chose, however, to de-emphasize the attrition of unescorted or poorly escorted bombers and reconnaissance airplanes. The problem, as commission members argued, revolved around how to provide security for other aircraft in a rapidly changing air war. The bomber community preferred close escort operations that ensured pursuit formations could provide protection for the bombers whenever and wherever enemy aircraft challenged the formation along the projected flight path. Commission members rejected this option in favor of "free pursuit that has the aim of inflicting sensitive and repeated losses on the enemy."⁶⁰ The authors argued that this tactic produced the positive results achieved by the pursuit units in the Battle of France. Moreover, the free pursuit organization allowed the *Armée de l'Air* to operate effectively with fewer pilots and airplanes across a wide theater of war. Providing escort fighters for every bombardment or reconnaissance mission would involve prohibitive expenses in men and material.

The flexibility inherent in the free pursuit tactics advocated by the commission would allow pursuit units to gain a measure of autonomy not afforded to the other air arms in the context of the joint theater command structure. This freedom stemmed from the unique aerial mission performed by pursuit aviation. While bomber and reconnaissance units provided combat support to terrestrial commanders, pursuit acted

⁶⁰ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,' : Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 111.

directly against enemy air power. The airmen argued that the joint theater commander would have little interest in controlling the details of pursuit operations as long as the aviators maintained air superiority over the Army Corps areas. Or, as the authors noted, "the free disposition of the pursuit groups is an evident necessity for the air division command."⁶¹ The most effective relationship between the joint theater commander and the pursuit units involved a loose form of coordination rather than the control envisioned for the other aerial arms. Close control by the theater commander would only hinder the rapid and spontaneous interception of enemy formations. This argument amounted to a declaration that only an airman, a specialist in pursuit employment, could plan and execute effective fighter operations. This represented a departure from the standard joint theater command structure that dominated Commission G's final report.

The complexity inherent in modern operations allowed both offensive and defensive battle to occur simultaneously. Pursuit aviation could adapt rapidly to the needs of this type of warfare. When the dominant theater strategy dictated a defensive posture, fighter units could provide cover and security for the combined air and land operations. Although defensive operations prevailed on the ground in this scenario, pursuit could offer the means to seize the initiative by conducting offensive sweeps against enemy air forces. Employed in this manner, pursuit set the initial conditions for the joint theater commander to transition from a defensive to an offensive posture. When French strategy dictated a shift to offensive operations, pursuit aviation could support the new strategy by combining offensive sweeps ahead of the advancing land forces with defensive security and air superiority missions.

⁶¹ Ibid., 116.

The commission members articulated a vision of a robust pursuit aviation arm that would operate in a semi-autonomous, but coordinated, manner with the joint theater commander. This characterization of pursuit aviation did not differ, however, significantly from the prescriptions found in the doctrines of the 1930s. Pursuit missions remained reactive at the tactical level while French strategy remained oriented toward defensive operations. Commission members used the lessons from the war to describe ways to combine offensive and defensive roles for pursuit aviation; in doing so, they aligned themselves with the traits of *lutte aérienne* that Air Force leaders articulated in the interwar years.

The characteristics of modern war, as the campaign of 1940 revealed to French airmen, erased the formulas that relied upon reconnaissance aviation that ranged near the lines of two relatively stationary armies. Yet, rather than diminishing the importance of reconnaissance aviation, the Battle of France drew attention to the need for an updated conception of how to process data obtained with air power into useful information for operational commanders. The commission's final report noted the consequences of operating with outdated ideas and methods. "Tied for the most part to conceptions of land combat that differed little in their essence from those of 1918, reconnaissance found itself surprised by the new procedures of modern war."⁶² In the commission's view the dawn of the Second World War heralded the end of days when reconnaissance aircraft could loiter over the enemy armies to take photographs that appeared at the headquarters hours later. The old paradigm worked because the tactical and operational situation

⁶² Ibid., 86.

changed slowly. Mobile warfare, however, required accurate and timely reports of enemy activities. Viewed in these terms, reconnaissance aviation suffered from the same ills that plagued other forms of French aviation in 1940. The formulas to correct problems in other areas of air power employment also applied, according to the commission, to the mission of battlefield reconnaissance and surveillance.

Organizational problems existed at the tactical level as well as at the operational level. One group commander complained bitterly, "If we now examine the group organization, we are struck by its complexity. Upon mobilization the group possessed one heavy aviation section, one autogyro section, one section of courier airplanes, a weather detachment, followed by a photo detachment."⁶³ The commander further observed that the diversity of resources and missions coupled with the lack of effective maintenance and technical support decreased his unit's combat effectiveness. Another air commander, Commandant Lanson, revealed the disastrous effects that stemmed from the ill-conceived command structure resulting in his group becoming separated from higher command echelons. "During the period 26 May -25 June," he reported, "I only exercised my command under abnormal conditions and I had practically lost all contact with the terrestrial and air commands after 13 June."⁶⁴ Lanson related that the V Army headquarters to which his unit reported shifted locations without informing him. He acted on his own initiative to move his unit to Dijon where he hoped to join air and land

⁶³ S.H.A.A., Série 3D, Carton 508, Commandant des Forces Aériennes 29, 32 Région Aérienne, "Remarques sur l'organisation et la mise en oeuvre d'un groupe d'aviation d'observation de division légère mécanique," Message 659/3, 29 July 1940: 3.

⁶⁴ S.H.A.A., Série 3D, Carton 508, 1^{ère} Région Aérienne, Base Aérienne de Montpellier, "Rapport du Commandant Lanson, Ex-Commandant des Forces Aériennes N° 24 sur les Enseignements à Tirer de la Guerre," 3 June 1941: 1.

forces as they regrouped to form a new defensive front. Lanson neglected to mention, however, that during this month of "abnormal" operations, half of which he admitted to losing all contact with higher command echelons, his unit could not have provided effective reconnaissance support to his superiors because of the disruption in the chain of command. Thus, the poorly conceived reconnaissance organization affected operations, subtly at first, through the inefficient flow of aerial intelligence and information, then more dramatically as headquarters personnel failed to manage the increasing flow of information after the German breakthrough.

The primary solution to the problems encountered by French air forces as they attempted to employ reconnaissance aviation centered on devising an appropriate command structure. Reconnaissance units delivered critical information to their command posts, but often the information failed to reach the proper command echelon, or the higher commands failed to act upon the data provided by the airmen.⁶⁵ Two components described the information management problem: first, the operational command structure did not allow for effective use of the available reconnaissance units; second, the organization did not have an intelligence processing component. As the intensity of the battle brought increased pressure on French air and land forces, these two problems complicated reconnaissance operations.

Commission members hewed to their conservative path when they outlined changes to correct the faults encountered with reconnaissance aviation. The requirements

⁶⁵ For a detailed daily report of the frustrations encountered by a reconnaissance unit commander as he tried to relay information to higher commanders see S.H.A.A., Série 3D, Carton 508, "Emploi des Forces Aériennes de Renseignement: Réponse au Questionnaire—Annexe II," Message 2644/C.I., 20 August 1940.

for aerial reconnaissance did not decrease as a result of the war; on the contrary, mobile warfare only increased the need for timely and accurate information. Airmen would continue to reconnoiter the battlefield in search of enemy forces, they would continue to adjust artillery fire, and they would continue to range ahead of friendly mobile forces as an aerial screening and protection force. While fulfilling these primary tasks, reconnaissance units could also search for information to pass on to pursuit and bombardment units. Aerial reconnaissance, in the commission's estimation, would receive the highest volume of mission taskings in future wars.⁶⁶

Centralized command structures combined with concentrated force deployments described the commission's formula for eliminating the flaws that plagued reconnaissance aviation employment. The centralized command structure, as in other aviation areas, ensured that reconnaissance remained responsive to the joint force commander's needs. Concentrated force deployments could prevent the dispersal and dislocation of tactical units as the land battle unfolded. Concentration at the tactical level also promised to facilitate the flow of information from the airmen to the proper command echelon.⁶⁷

Commission G accurately described the changes in operational warfare that the German attack in 1940 revealed. The authors of the final report remained reluctant, however, to urge the leaders of the *Armée de l'Air* to abandon doctrinal prescriptions that guided the service throughout the 1930s. They concluded that combined arms warfare

⁶⁶ S.H.A.A., Série 3D, Carton 477, État Français, Secrétariat d'État à l'Aviation, "Enseignements Aériens de la Guerre, 1939-1942, Commission 'G,': Deuxième Partie, Les Armes et les Moyens d'Exploitation," March 1942: 87-88.

⁶⁷ Ibid., 92-98.

established a permanent place for air power in operational strategies, but that air power should serve the needs of a theater land commander. The *Armée de l'Air* could not effectively support efforts to repulse the German offensives in 1940 because the existing command structures did not allow air and land commanders to unify their efforts. A more effective theater command scheme in which the senior aviator served as a technical and tactical adviser to the joint force commander promised to allow future leaders to correct the organizational problems that plagued the French military in the Battle of France.

Aviation units could retain traditional roles and mission tasks under the unified theater command structure that commission members proposed. Pursuit aviation proved the soundness of pre-war tactical doctrines in the eyes of the commission members. The necessity of gaining and maintaining air superiority meant that pursuit should have a dominant tactical role. But the airmen realized that Army commanders would want to dictate pursuit, and indeed all, aviation activities in their operational areas. Therefore, the final report asserted that every unit in the military establishment should possess the means to defend itself from aerial attack.

Bombardment and reconnaissance aviation aligned more closely with the needs of the land battle in the commission's assessment of future needs. The failure to detect and stop, or at least slow, the German advance seared the importance of providing timely intelligence, close air support, and battlefield interdiction into the pages of the final report. Massive strategic bomber attacks against enemy towns and industries had not occurred on a large scale while the commission members worked on their study. They

apparently could not convince themselves to argue for a bomber force that contained both specially trained close air support and strategic bombing components.

The humiliation and the agony of the defeat caused the leaders of the *Armée de l'Air* to examine their operations and their doctrines in detail. The natural tendency under such conditions would be to argue for abandoning formulas that failed the test of combat. Surprisingly, however, Commission G suggested few substantial changes to the fundamental and tactical doctrines that the air service developed in the 1930s. The most significant flaw, the barrier to combat effectiveness that emerged from the commission's efforts centered on organizational doctrine. The principles of *lutte aérienne* and the tactical employment concepts of the interwar years required little change to meet the needs of modern, mobile warfare on land. The joint theater command organization that tied the conceptual applications of air power to the tempo and scope of land warfare would keep airmen focused on tactics. This limited vision also applied during the 1930s. The result then was an Air Force that remained unable to seize initiative at any level of war—strategic, operational, or tactical. Consequently, the *Armée de l'Air* reacted to every demand for aviation—it could do little else.

CHAPTER 7

CONCLUSION: THE *ARMÉE DE L'AIR* AND REACTIVE DOCTRINE

The airmen and politicians who led the *Armée de l'Air* as it served the Third Republic worked diligently to create a military institution that they believed met French defense needs. Their efforts revealed the difficulties that arose when air power theory clashed with established notions of how to employ air forces. As competing opinions about the proper role for the Air Force emerged, airmen changed their ideas and methods to accommodate Army and Navy leaders. As Air Force leaders altered their arguments to conform to prevailing notions of warfare, they gradually lost sight of the unique characteristics that set air power apart from land and sea power. Reactive doctrine crept into every aspect of the air service because the airmen failed to argue effectively for a distinct vision of warfare predicated on the dominance of the air weapon.

The historical experiences of the First World War and the 1925 Rif War in Morocco established a tradition of cooperation between air and land forces. Air operations in the Great War derived strategic and operational guidance from Army commanders. Late in the war, however, airmen began to propose and experiment with concepts of strategic bombardment that promised to liberate the air arm from the

constraints of a land based operational philosophy. Limited opportunities to apply air power against strategic targets laid the foundations for French airmen to consider the potential for independent air operations during the interwar years.

In the Rif War, airmen faced a dramatically different tactical and operational context than the one they encountered in the First World War. Air power fulfilled many of the traditional roles established during the European conflict, but in ways that stressed the flexibility and initiative for the air forces rather than the traditional dependence and subordination to land commanders. The airmen of the 37th Aviation Regiment earned the respect of their Army brethren as they responded to the operational and tactical situation in a fluid colonial war. The doctrinal legacy of the Rif War was a new definition of how air forces should work in concert with land forces to achieve common goals. Airmen proved themselves able to formulate operational strategy that capitalized on the unique characteristics of the aerial weapon. Air power allowed Lyautey to preserve French authority in Morocco. The relationship that proved so effective in the Rif conflict did not survive, however, as the French government moved to create an independent air service.

Pierre Cot influenced the shape of the *Armée de l'Air's* fundamental doctrine more than any other public figure. Cot recognized that French society would not support aggressive land warfare strategies. He also realized that France would require a military force that could support diplomatic initiatives if the nation were to avoid war with Germany. The Air Force offered attractive advantages over Army forces because aviation could threaten German strategic and operational centers of gravity while theoretically avoiding costly land engagements. Cot urged airmen to develop a doctrine

and a force structure that fulfilled the strategic roles that he believed the nation required to compete effectively against a resurgent Germany.

Cot and his colleagues in the Air Ministry devised a fundamental doctrine that sought to capitalize on the offensive potential available in aerial warfare strategies. The concept of *lutte aérienne*, a unified aerial battle, concisely expressed Air Minister's ideas about independent air operations. The fundamental doctrine grew to include a vision of a joint battle. The concept contained the proposal that air forces could bear the responsibility of conducting the war effort while land forces supported the *Armée de l'Air*. *Lutte aérienne* also represented a compromise that sought to accommodate the defensive doctrines and strategies that dominated Army plans before the Second World War. Aligning fundamental air doctrine with Army plans represented only one reason for expanding the boundaries of *lutte aérienne*.

The law that established the *Armée de l'Air* as a separate service directed the Air Force to develop capabilities that allowed it to cooperate with air and sea forces. This legal requirement forced French airmen to describe *lutte aérienne* in terms of simultaneous land and air wars. The defensive component of the land war introduced a defensive aspect to the aerial effort that the airmen envisioned in their doctrine. This modification to the doctrinal structure was not harmful when considered in the context of an evolving theory of air power. French strategic calculations certainly emphasized the primacy of defensive operations throughout the 1930s—the *Armée de l'Air* had a moral and a legal obligation to devise a concept of war that served the national strategy. But the combined effects of defensive and cooperation missions opened new possibilities for Army and Navy leaders to reduce the authority available to operational air commanders.

The failure of the *Armée de l'Air*'s leaders to obtain a satisfactory organizational doctrine that preserved the service's role in joint operations added another facet to the reactive approach to aerial warfare. Airmen found themselves moving from positions of relative equality in joint command organizations to positions that left them subordinate to Army and Navy commanders. The final insult, in organizational terms, occurred in September 1939 and February 1940 when the illusion of an independent air service evaporated in the wake of the dramatic organizational changes that made the air units subordinate to Army Corps and theater commanders. Air leaders found their air power dispersed among Army units while they became little more than technical advisers for the Army commanders.

With their fundamental and organizational doctrines compromised, the airmen turned to the process of developing tactical doctrine. Tactical doctrine, however, guided the *Armée de l'Air* further down the path toward reaction and compromise because tactical plans placed the air service in a defensive, cooperative posture. The tactical formulas contained in published regulations failed to describe how the *Armée de l'Air* could seize the initiative to accomplish operational objectives that would contribute to winning a war against Germany.

Theories and doctrine manuals comprised only part of the process that resulted in a reactive posture in the French Air Force of the 1930s. The training system that provided aircrew members, technicians, and support personnel to man tactical units reinforced reactive tendencies established in the fundamental, organizational, and tactical doctrines. Air Force leaders expected the training system to prepare service members for war while it also educated them about the intricacies of European politics. One of the

implied goals of regular training syllabi focused on building a common understanding among airmen of the political, economic, and military causes of European conflicts. The structure that the training regulations described, however, never met the expectations of Air Force leaders.

The training system never gained enough institutional strength to function effectively as a vehicle for developing air doctrine. The Air Staff's poor management of the elements of the training system contributed in a significant way to the poor results achieved during the 1930s. Air Staff personnel often directed school commanders to create new schools to meet steadily increasing requirements for trained personnel. Staff members failed, however, to ensure that adequate facilities, personnel, and equipment reached the new schools; consequently, the new schools only increased the burdens on the system. Growth and inefficiency characterized the decentralized training system that consistently fell short of the *Armée de l'Air's* goals and requirements. The strategic emergencies of the second half of the decade caused the Air Staff to intensify its efforts to improve training productivity.

By the late 1930s, the training system operated in a state of perpetual crisis. Tactical units clamored for trained mechanics, pilots, instructors, and other technical personnel. The schools could not increase production quickly enough to meet operational demands. A severe shortage of qualified instructors in all specialties guaranteed that the situation would take years to remedy. The Air Staff responded in its usual manner; staff directives ordered the creation of new instructor schools while simultaneously removing instructors from tactical units to perform school duties. Neither measure solved the Air Force personnel shortage problems.

The Air Staff became increasingly concerned as war loomed on the horizon that the school system would fall prey to enemy air attacks. After much debate, the Air Minister and his staff ordered certain elements of the training system to plan for evacuation to North Africa. This decision, like so many in the *Armée de l'Air* of the interwar period, came too late to provide an effective counter to the threat posed by enemy aerial bombardment. Moreover, the move to North Africa exacerbated the personnel shortage by decreasing student production at a time when the training system needed to run at full throttle.

The *Armée de l'Air* could not reverse its inclinations toward reactive doctrine through maneuvers and exercises; those inclinations actually increased. The air service followed a regular schedule of exercises and maneuvers from 1933 to 1938. After 1938, the wave of political crises that swept Europe caused service leaders to suspend large-scale exercises in favor of more focused preparations for war. The annual maneuvers included political scenarios that accurately depicted the outlines of a possible war with Germany. The operating vision for air power in the annual maneuvers rarely conformed to the prescriptions of *lutte aérienne*. Instead, the Air Staff scenarios and exercises forced the *Armée de l'Air* to operate from a defensive posture in support of Army ground units. The air service's failure to employ bombardment and pursuit forces in a manner consistent with the precepts of *lutte aérienne* in exercises and maneuvers damaged the *Armée de l'Air*'s offensive potential. Bombardment units habitually acted as target drones while pursuit aviation grew accustomed to scripted combat scenarios.

The exercises served one useful purpose—they highlighted the poor levels of proficiency among the *Armée de l'Air*'s operations and support personnel. Like so many

other flaws that came to light in the French Air Force of the 1930s, this realization proved to be a mixed blessing. Service leaders used the exercises to provide much needed training for personnel who failed to demonstrate proficiency in their assigned combat specialties. This deviation from the exercise scenario prevented the realization of the stated exercise objectives. The exercises became training opportunities rather than functioning as the rehearsals for theater-level air warfare as the Air Staff intended.

The Air Force suffered along with the Army and the rest of the nation in the defeat of 1940. The reactive nature of the *Armée de l'Air's* approach to air warfare forced the service into a tactical role while German air power conducted a successful operational and tactical campaign. French airmen could only achieve temporary local successes against the better organized, equipped, and trained German air forces. Surprisingly, air service officers, after closely examining the experience of the defeat, retained the broad outlines of the reactive doctrine that prevailed during the 1930s. The commission that analyzed the *Armée de l'Air's* performance concluded that French military strategy should adapt to new operational conditions. But the prescriptions for air warfare outlined in the commission's final report remained focused squarely on the tactical roles that the air service performed in 1940 and throughout the interwar years.

During the 1930s, the leaders of the French air arm tried to create a service capable of contributing to a fundamental change in the philosophy and practice of war. Doctrine represented one of the primary structures that defined the purpose of the air institution within the larger defense establishment. Doctrine outlined the parameters for how the air force interacted with the government, with the army, and with the navy. And, ultimately, doctrine described how the *Armée de l'Air* intended to perform its primary

function—wielding air power to support national offensive and defensive strategies against various known and unknown enemies.

The failure of the French air force in the 1930s was not an intellectual failure. Nor did the air force fail to develop structures that supported national strategies. The *Armée de l'Air* created institutional structures designed to promote thinking about how to use air power in concert with other methods of war. The failure was not the lack of a strong air institution capable of soundly thrashing the Luftwaffe. Rather, the failure of the *Armée de l'Air*'s leaders in 1930s rested in their inability to develop and defend a vision of air power that preserved the unique capabilities that stemmed from the ability to operate in the air.

Armée de l'Air leaders were neither decadent, nor traitorous, nor stupid. They faced the complex task of constructing a more complete theory of air power while simultaneously fulfilling strategic and operational missions within an Air Force that had not yet attained a mature institutional identity. The task became more difficult because war remained an ever-present threat throughout the decade. Strategists and diplomats in France viewed air power's potential as an effective deterrent that could protect the nation while it concealed the Army's weaknesses.

The leaders of the air service could not develop their theory and doctrine free from competing institutional influences. The French air arm struggled with the constant demands for air support from the Army and the Navy. The pressure of those demands gradually altered air service priorities. As priorities changed to emphasize the limited vision of land warfare, air service capabilities conformed to the tempo and scope of the ground battle. But the land warfare that the *Armée de l'Air* prepared to support followed

principles of fixed fortifications and firepower. In this view of war, air power performed most effectively in reconnaissance and air superiority roles. Airmen failed to examine and change their doctrine in light of the altered operational priorities. The French realized—too late—that they needed a more potent offensive form of air power to complement the land and air defensive forces.

French air doctrine became more reactive as the *Armée de l'Air* struggled with conflicting strategic and operational issues in the 1930s. Reactive doctrine evolved as a function of an incomplete or flawed theory, but an incomplete air theory is not sufficient to spawn a reactive doctrine. Political, strategic, and operational influences may force a service to adopt a reactive approach. The shifting political and strategic circumstances in the interwar years kept French airmen in a reactive posture while the pressures from the Army and the Navy kept the *Armée de l'Air* off balance. Finally, reactive doctrine was a product of the air service's focus on tactical matters rather than upon strategic or operational concerns. The French Air Force's ability to develop a doctrine for strategic and operational air warfare remained stillborn in the 1930s. When war came in 1939 and 1940, the airmen could not articulate a unique vision—the perspective from the air—of how to counter the German attack. This became the essence of reactive doctrine and remained the legacy of the *Armée de l'Air* of the 1930s.

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